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An Address

ARTERIAL DISEASE AND RENAL INCOMPETENCE*

OSKAR KLOTZ, M.D.

Professor of Pathology, University of Toronto

THE subject which we are to consider is one of the most attractive for study and the most difficult in which to arrive at conclusions in pathology; attractive because it has so many phases and related conditions to consider; difficult because we are still in the dark respecting the normal physiology of many of its parts. When we look over the most notable of the contributions which have been made in this field, and few subjects have had such a host of authors, we are reminded, by a preface in each, that when Richard Bright, in 1827, published his "Cases and observations illustrative of renal disease accompanied with the secretion of albuminous urine," he set in motion an enquiry that has been unremittingly pursued for close on to a century, and which is to-day far from its goal. It is not for want of adequate interest, nor for lack of intelligent approach on the part of the clinician, chemist, physicist, or pathologist upon which our dissatisfaction at the results rests, for each has approached the problem in turn, has accomplished something, has come to a point where his special mode of investigation no longer was of value, and then turned back hoping that the other sciences would clear more ground to permit him to proceed further. Each of these attempts has carried our available information a step forward, but progress seems slow and we are impatient. At times our faith in the acceptance of material advance made by others was rudely shaken, when the over-enthusiasm of the investigator led to the enunciation of dogma, all of which had to be verified by lengthy repetition of observation and experiment. And so advance has been slow. There have been no startling discoveries in the study of Bright's disease, and I doubt whether we may expect them. The work has been mainly one of accumulating knowledge by experience and hard study.

Bright's disease, with its many associations in distant organs and tissues, with its intimate relation to lesions in the heart and arteries, with its outstanding sequelæ of cerebral hæmorrhage and uræmia, and its relation in ways yet unknown to arterial hypertension, offers to every investigator in the field of medicine a share in the solution of a problem, which by its ever increasing frequency stamps its importance in our vital statistics. The consideration of Bright's disease must always be made from the standpoint of the clinician. Bright's disease is essentially a clinical complex dependent upon an inadequate or an improper function of the kidney; furthermore, it must always remain of first importance to the clinical observers, while the application of chemistry and physics and of the microscope are adjuvants in obtaining a clearer understanding of the varied events which take place in the course of each case. It is often our haste in applying the methods of the ancillary sciences which leads us into wrong interpretations, and in some instances has for years led us astray. The physicist, but a short while ago, stressed, in the study of Bright's disease, the value of the freezing point and the electro-

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conductivity of the blood and urine in indicating the presence of retained waste products. We provided ourselves with a new equipment of expensive instruments, only to find that the normal variables are much too great to allow us to make deductions in the cases of renal disease. Furthermore, the results obtained by these elaborate means were available to us by other simpler methods. And then too we have followed one by one the determination of the relative quantities of different metabolic products in the urine and blood, hoping that some one substance might serve as an index for all of the renal function. Here again we have met disappointment, in that it would seem that no single substance is an index of the secretory ability of the kidney for anything but itself. In general, the ease with which the kidney may handle nitrogenous waste, is still the best index of what is going on in this organ. Nevertheless, the information which becomes available by offering a variety of test substances gives at least additional confirmatory evidence of the nature of the renal incapacity.

Of all renal affections, the chronic stage is for us the most important, as it is the one most often met with and is the one in which our resources are taxed to their utmost to attain a sufficient insight to be correct in our diagnosis and prognosis. The chronic renal disturbances have always been common, but in modern life are seemingly still on the increase. In it we have a name—chronic—suggesting a preceding acute phase, but which often cannot be revealed in the clinical history and was never experienced by the individual. The stage of chronicity has usually been reached by an insidious progress of a lesion which in its earlier phases had little or no influence on the renal function. The chronic lesions were those mainly dealt with by Bright; likewise the interest of Johnson, Gull and Sutton, Mahomed, Cohnheim, and the many others in the early history of the disease, centred about the late stages of incompetence rather than the acute. From almost the very first, we find successive authors making attempts at the interpretation of the clinical manifestations, and trying to give explanations based upon anatomical changes. Hence it was but natural that the diseases of the kidney as studied during life were given classifications of a purely pathological kind. Every few years, the classification has been changed and with each change we are confronted by a new nomenclature which is equally dogmatic as its predecessor, only to be found inappropriate with the newer enquiries.

Unfortunately too, the term chronic is used so constantly in relation to inflammatory processes that its association with such an indefinite process as Bright's disease has led to the unjustified acceptance of the term nephritis as synonymous with it. There is no lesion more difficult to analyze, indicating the manner of origin of this reaction or that, than we find in chronic Bright's. In fact, this has been our main concern, our bone of contention in the field of pathology, to determine the mode of development, step by step, of the end products found in the altered kidney structure. To what extent has inflammation entered into it, or has the change resulted through toxic damage, or was it an altered nutrition? But in truth these organic tissue changes which make up the kidney lesion are not the evidences during life upon which the clinician must determine his diagnosis. The factors at his disposal are varied, in part being found in the character of the urinary output and indicating the ability of the kidneys to remove certain waste products, and in part also to be observed in the condition of the patient, evidenced in fatigue, in an œdema, in hypertension of the arterial blood, in toxic symptoms as in uræmia, or in the late secondary event of cerebral hæmorrhage.

On the other hand, quite apart from the studies which have been made upon kidney incompetence, much attention has been given to the disabilities of the arterial system, and although it would seem that in this case much greater effort has been put forward in studying the lesions from the pathological aspects, yet the clinician, physicist, and chemist have all assisted in attacking the problem of arteriosclerosis. Possibly the solution of the question and a clear understanding of arteriosclerosis is still farther afield than is that of chronic nephritis, in as much as arteriosclerosis as a disease is not an entity, but one which manifests itself clinically in relation to the secondary derangements appearing in organs especially and specifically involved. For our present purposes, and a matter which we shall discuss again, it is well to remember that arteriosclerosis is a disease not necessarily localized to one system or

another, but it may occur diffusely spread throughout the body or it may occur in a particular region or in several localities at the same time. Furthermore there are several varieties of arteriosclerosis, each having a meaning to itself, and interestingly enough it is not uncommon to find two types of arteriosclerosis, presumably of different etiology, in the same individual or even in the same vessel. What we have said of arteriosclerosis applies equally well to the aorta as to the arteries of the heart, brain and kidneys. Now one of the greatest difficulties in an analysis of arteriosclerosis is to determine whether the factors bringing about the sclerosis are localized and peculiar to the organ in which the disease is found, or whether these scleroses are only a part of a general process in many parts of the body, with accentuation of functional disturbances in this one part.

The common association of lesions of the arteries with those of the heart or the kidneys, or the not infrequent appearance of diseases simultaneously in all three is so well known to require no comment; but what does deserve further attention is the appreciation that under such circumstances the greater part of the injuries which are inflicted upon the heart, the arteries, and the kidneys may be the result of a common cause acting upon each and that the secondary influence of disturbed function of one producing injury upon the other is of lesser importance. It is this point we wish to stress, for too many hypotheses (implicating heart, kidneys, or arteries in turn) to explain the presence of clinical manifestations have continued to becloud the real issues in our problem.

Probably no clinical manifestation, linking the renal incompetence with arterial lesions, has attracted more attention than "increased arterial tension." This inter-relation of kidneys to circulation was suggested by George Johnson, and became the view of Traube, Burdon-Sanderson, and many others; but from time to time the original attitude of regarding the increased blood-pressure as belonging to purely a disease of the kidneys, was altered to admit new observations which no longer would fit into the original hypotheses. Mahomed's belief that the excessive arterial pressure was an index of altered renal function, and that clinically it was manifest before any other evidence of kidney impairment was demonstrable, received support in the study of certain cases of increased blood pressure with no urinary changes and no objective heart or arterial lesions. Mahomed considered these as early cases of "chronic" nephritis in which the kidney damage was in its incipient stage or as he called it the "pre-albuminuric stage." Sufficient evidence has accumulated since the indication by Allbutt and Hutchard to show that there is no parallel lesion between the albuminuria and the increased blood pressures, and that albuminuria is not a distinctive manifestation of Bright's disease. However, quite aside from the particular manner in which a relationship may be established between certain chronic diseases of the kidney with alterations in the heart, arteries and the circulation, the evidence is sufficiently clear that there is a close interlocking of the functions of these systems; that each has a dependence upon the healthy activities of the other, and that there appear to be some common factors causing disease, which act on one or more of these systems at a time.

Our present day conception of chronic Bright's disease, permits us to recognize a number of definite pathological types, of which the inflammatory group,—glomerular, inter-tubular, and perivascular—is the most important, while the true arteriosclerotic kidney when not involved in simultaneous or secondary inflammation is of much lesser consequence. It has been our experience that sclerosis of the arteries in the kidney is of much more frequent occurrence amongst our cases of chronic Bright's than our nomenclature would lead us to suspect. To begin with, virtually all, if not all, kidneys belonging to the type of the "secondary contracted kidney" show some type of arteriosclerosis, though not always equal in amount nor similar in disposition. All who have studied these kidneys have observed the irregular involvement of the glomeruli and the neighbouring interstitial tissues in processes of inflammatory fibrosis. The glomeruli are often obliterated in great numbers by a hyaline fibrosis; they become adherent to Bowman's capsule; and the tissues about these structures likewise become involved in the end-products of inflammation. The distance to which the inflammatory process has invaded the surrounding parts varies tremendously from, on the one hand, being confined to band-like zones, to, on the other, spreading diffusely through the

cortex of the kidney lobules. Every true chronic glomerulo-nephritis in man has its inter-tubular involvement. In other words the extent of the involvement of the kidney cortex during what we speak of as glomerulo-nephritis, differs very markedly in the different cases. Not only this, but when we study the intermediate zone of the lobule, as well as the inter-lobular region we find some of the inflammatory products affecting the vascular structures. One of the commonest reactions in the late stage of Bright's disease is a perivascular fibrosis, while lesions in the intima of the arterioles are not at all infrequent. Intimal hyperplasia, fatty degeneration, splitting of the elastic lamina are all very common and can, I believe, be regarded only as types of reactions accompanying an inflammatory process. We have previously indicated that whenever processes of inflammation are induced in the vicinity or in the wall of arterial trunks, changes are induced in their tissues leading to some form of arteriosclerosis. These arterial changes may be brought about at any age and have been observed in the meninges, heart, and kidney.

Thus it is found that the lesion of glomerulo-nephritis, aside from the embolic type, is not an inflammation restricted to one element of the kidney structure but is a more wide-spread process involving various parts of this complex organ, and incapacitating each portion to a variable degree. A modern classification attempts to differentiate the pathological process as seen in glomerulo-nephritis from another in which the arterial system in the kidneys is also involved. The difference is one not of kind but of degree. We have yet to see the kidney of a case of chronic diffuse glomerulo-nephritis in which arterial lesions are wanting.

There is not one of the kidney diseases which in its late stages offers the difficulty of analysis as seen in glomerulo-nephritis. It is, we believe, a mistake to neglect the associated processes in the renal structures while the glomeruli are being involved by inflammation. We realize that in a study of the lesions in experimental animals, it has been possible to induce proliferative reactions along with processes of degeneration in the glomerular tufts, but whether we are right in interpreting such as a type of inflammation is still under discussion. These animal experiments have shown that a type of pure glomerular response can be called forth by artificial means and by rare poisons, but I know of none in the human which in its late stages takes on the quality of a chronic glomerulo-nephritis in which other parts of the kidney structure do not to some extent become involved.

The so-called chronic glomerulo-nephritis constitutes a very large proportion of our cases of Bright's disease appearing after middle life. The process of inflammation which marks this type of disease, may at times be markedly prominent in the glomeruli, but at other times may be outstanding in the inter-tubular zones or in the inter-lobular structures and particularly about the blood vessels. Gull and Sutton paid most attention to the cases in this last group and have described the periarterial fibrosis. Although their observations were incomplete and they did not distinguish one type of arterial lesion from another, it would seem that they did recognize the inflammatory nature of the lesion which is localized in these tissues.

Let us now view this problem from another angle, and observe the frequency of arteriosclerosis in the renal vessels as well as the incidence in which these arterial lesions are accompanied by inflammatory processes in neighbouring or distant parts of the kidney.

Arteriosclerosis of the renal vessels is found to have a localization and a frequency which is different for the main renal artery and its primary branches, from that in its distal ramifications in the parenchyma of the kidney. Were we dependent upon the analysis of arteriosclerosis as it is found in the trunk of the renal artery, our findings would be out of keeping with the results usually tabulated for renal arteriosclerosis. It is of interest to note that the renal artery and its first branches which lie at the hilus of the kidney are not very commonly involved in arteriosclerosis. In fact, arteriosclerosis of these vessels is less usual than that in the majority of the peripheral arteries, such as the iliac, popliteal, tibial, brachial, radial, coronary of heart, cerebral, splenic, and many others. On the other hand the parenchymatous branches of the renal artery are much more commonly the subject of sclerosis than the parent stem, and quite as commonly as many of the other peripherals. A further analysis of these differences is at present being made in our laboratories by Dr. B. I. Johnstone.

The sclerosis of the main renal vessels is usually not extensive, consisting of a harmless hypertrophy of the muscular coats or a mild endarteritis. Occasionally the endarteritis in one or other of the primary subdivisions does encroach upon the lumen to a degree sufficient to disturb the circulation to a segment of perhaps one, or it may be of two lobules of the kidney with the result that a nutritional atrophy of the kidney occurs in the involved area. The outcome of the injury leads to a depressed scar having all the resemblance of an infarct. There may be several such puckered areas over the surface of the kidney, giving it a distorted appearance. But even when scleroses in the right and left renal branches produce atrophic puckerings in the kidney they have no material influence upon the efficiency of the kidneys unless there is also present a true nephritis. These true arteriosclerotic kidneys are usually met with as accidental findings at the autopsy, in elderly individuals. By themselves they do not lead to clinical signs, as the quantity of renal tissue undisturbed is much greater than the essential minimum for renal excretion. Furthermore this type of renal arteriosclerosis has no direct relation to hypertension; the blood pressure may be normal or for other reasons it may be elevated.

Some confusion has arisen in the discussion of the so-called arteriosclerotic kidney, in grouping the above type of arterial and renal lesion with the one in which the sclerosis involves the arteries within the kidney itself. We must insist that the lesions in the arteries may differ very materially in these two sets of vessels, and that the outcome of the sclerosis is also widely different. We have indicated how relatively unimportant is the sclerosis of the external renal vessels and how limited is the influence of its presence. The sclerosis of the external renal vessels resembles the influence of the experimental ligation of branches of the renal artery, wherein typical infarcts are induced without influencing the pressure of the general circulation. How different is this from the associated effects in the presence of sclerosis of the internal renal arterioles, the branches of the inter-lobular vessels. In this latter affection the vessels throughout the kidney, and on both sides, are involved in sclerotic processes. These scleroses are commonly types of endarteritis, with or without splitting of the internal elastic lamina, and often accompanied by degrees of fatty degeneration. The condition is diffuse, it follows the vessels in the intermediate zone to the branches which enter the medulla and cortex. Sometimes one may distinguish some hypertrophy of the media as it was long ago described by Johnson, but this is less often observed than in the external arteries. Moenckeberg's sclerosis is very rarely encountered in the renal vessels, but periarterial fibrosis is common, and seemingly is in part related to the inflammatory fibrosis which pervades the neighboring tissues.

This diffuse sclerosis of the system of internal renal arterioles is the type of lesion which has been discussed as having a relation to chronic nephritis and to hypertension. From our observations we are unable to dissociate this form of sclerosis from chronic fibrosing nephritis, and we find that virtually all cases of chronic intertubular glomerulo-nephritis have some degree of arteriosclerosis in the vessels of the parenchyma. The difference in many cases is one of degree, at times the glomerulo-nephritis being markedly to the fore, at other times the inter-tubular fibrosis being most prominent. This group of reactions about glomeruli, tubules and vessels is of an inflammatory kind and the end result is a contracted kidney, with a granular surface, with or without an adherent capsule, and at one time appearing red through vascular congestion, and at another appearing white through parenchymatous degeneration.

Years ago Allbutt argued the problem whether we should consider the so-called granular kidney as the outcome of a general arteriosclerosis. The French school have insisted that the insidious spread of arteriosclerosis to all parts of the body, gradually invades the parenchymatous vessels and leads to sclerosing processes in these. Even Jores suggested that an arteriosclerosis may begin in the main renal vessels and then extend inwards to involve the fine branches. And Hutchard never distinguished between the senile sclerosis with its atrophic sequelæ and the changes occurring in the granular kidney. All of the questions surrounding these problems are not answered today, but we may feel reasonably certain that no single dogmatic rule will suffice to explain the sequence in all. Lorrain Smith who gives a clear description of the changes arising in

chronic nephritis, indicates that the picture is not a constant one, though it may be the factors at work are similar.

Perhaps it were better that in place of attempting to be too specific with our nomenclature, we adhere to the more general term, "chronic nephritis"—and in this group we admit of only those cases which are truly inflammatory. To make subdivisions within this group is to lead to confusion without improving our ability at clinical diagnosis. There is as yet no sure sign or symptom until late in the disease to tell us which of the three elements in the renal architecture is most severely damaged, and as in no case is one element solely involved, we gain naught by our too minute subdivisions. All classifications are at best arbitrary.

To the pathologist the study of the lesion of the kidney must be pursued with new vigour. Much has been demanded of late that the study of the morphological changes must be accompanied by, or better, preceded by a thorough study of the functional capacity. In carrying out this routine, the study of the kidney becomes confined to those cases in which the clinical evidence was sufficiently great to leave no doubt as to the renal incompetence. Such cases may have much detailed analysis of the blood and urine, and at autopsy reveal a kidney showing all the distortion of advanced and mixed processes. What is more essential is a study of the renal lesions in young individuals who have shown little or no excretory incompetence but in whom one may trace a relationship with lesions in other parts of the body.

We wish in no way to detract from the value of chemical analyses of blood and urine in all cases of Bright's disease. To determine the functional capacity of the kidney, and its ability to excrete the normal constituents of the urine in proper proportion, along with the evidence of the accumulation of waste products in the blood, is of value to the clinician in treatment and prognosis, but as a factor indicative of a particular lesion in the kidney it is only available in the late chronic cases.

For the past few years the term "arteriosclerosis" has been too liberally applied to types of kidney lesions, without giving any regard to the nature of the changes in the arterial coat, and with an unfortunate finality suggesting that the disease of the arteries was a primary and independent process which was subsequently followed by renal incompetence. In the restricted sense this sequence holds true only for the sclerosis of the main renal vessels and their primary branches, giving rise, as an end result, to the arteriosclerotic atrophy of the renal tissues. Under these conditions the changes in the kidney consist of a loss of the parenchyma, by atrophy, associated with a contraction and filling in of some of the local areas with scar tissue. This is the typical arteriosclerotic kidney appearing in advanced years of life, and giving no evidence of renal incompetence unless another unassociated kidney disease influences its excretory ability.

When, however, we encounter the sclerosis of the vessels within the parenchyma of the kidney, we may meet with lesions in the vessel walls of an entirely different kind, and also of an origin usually quite apart from that in the larger external arteries. It is most common that the scleroses within the kidney are independent and unaccompanied by an arteriosclerosis of the main renal trunk. Furthermore the sclerosis of the arteries of the parenchyma appear at ages much earlier than the latter. Jores and others have discussed the arteriosclerotic process in these finer vessels in the kidney and have found that hyperplasia, hypertrophy and fibrosis are present along with fatty degeneration in the deep intima and splitting of the elastic fibres. All are willing to accept these types of arterial change as belonging to arteriosclerosis, although the extent of each of the different kinds differs much in the individual cases. Moreover, these authors have always described these arterial changes in cases in which some other kidney lesion is also present. No case, to my knowledge, has ever been described in which proof was available that the arteriosclerotic process of the parenchymatous vessels of the kidney preceded the other reactions which were also present.

It is interesting to note that although the arteriosclerotic processes in the renal vessels are not always the same, and that the very nature of the changes in the arterial wall suggests a difference in the mode of development, no great attention is being directed to this fact. We are confident that the varieties of arterial affection have a significance more than the late influences by them upon the local circulation, and that t'

characters of some bear a direct relation to the other renal processes.

Arteriosclerosis which was formerly regarded as a normal malady of old age is day by day becoming more precocious. Arteriosclerosis appearing at thirty-five and forty years of age is no longer a rarity. Such scleroses arise at periods when high pressure is not evident, and in which hyperpiesis does not usually make its appearance until the scleroses are well advanced and have proved themselves as permanent lesions. We are aware that juvenile arteriosclerosis is not uncommon, following infectious diseases. It is claimed by some that these disappear to some extent; others, however, remain permanently leaving their scar upon the wall and causing circulatory interference to some degree. These lesions become cumulative where the individual suffers recurrent infections of the same kind, as occurs in rheumatic fever and non-hæmolytic streptococcus infections, or where the individual suffers a succession of different damaging systemic diseases. Recently I was shown by Dr. Isaac Erb, specimens of a case of Moenckeberg arteriosclerosis occupying the arteries of almost every organ in the body of a child six weeks old. This is very unusual, but yet we meet with arterial thickening in diabetes, in girls and boys in their 'teens when the blood pressure is not elevated.

The majority of cases of chronic nephritis come to the clinician for advice upon conditions other than those directly referable to the kidney. They vary in age from thirty to fifty. Headache, nervousness, insomnia, a high blood pressure, cardiac distress, cerebral involvement, neuro-retinitis or less of weight, may each be the first sign to lead to a subsequent diagnosis of chronic nephritis. Some clinicians lay more stress upon one or other of these manifestations, but probably there is no finding which gives as much concern in the early recognition of chronic Bright's disease, as an increased blood pressure. It is interesting also to observe that one of the most common organic lesions coupled with advanced chronic Bright's disease and hypertension is thickening of the arteries; whether this is found in the vessels of the retina, in the brachial or temporal arteries, or in the vascular channels of the heart or brain, it is true that sclerosis of the arteries of the peripheral tree are a fairly constant accompaniment of the late renal lesion. One difficulty in diagnosis, however, arises in those cases where there are well marked vascular lesions and hypertension, but in which no renal insufficiency is to be recognized. The arterial lesion may long precede the progress of the change in the kidney, so that the case is not to be recognized as one of chronic Bright's disease until the kidney damage is well advanced and irreparable. These events do not always arise in this order, for in others the renal damage leads in its appearance the vascular sclerosis, or again we find cardiac lesions in musculature or valves preceding both arterial and renal incompetence. In the end the picture tends to assume a common type and the long list of manifestations of chronic renal disease with its complications and sequelæ closes the picture of a very complex disease.

Hypertension is the one problem around which the discussion upon heart, arteries, and kidney find common ground. Krehl denied that nephritis had any relation to increased blood pressure, while Janeway maintained an intimate relation between heart, arteries, and kidneys, and "that the influence of the kidney upon the circulation is as unequivocal as the influence of the circulatory system upon the kidney." Be this as it may, I believe that an understanding of this complex situation is much more easily obtained when we realize that these three important systems are all influenced by common agents, be these poisons, toxins, bacteria, or fatigue. It is not unusual to observe injury upon each of these structures, by a common agent, and there has been ample evidence that lesions are extremely widespread when chronic Bright's is discovered. Heart, arteries, and kidney are involved, at times mildly in heart and arteries, but again it may be severely and overshadow the picture. Advanced chronic nephritis with its local inflammatory residues in several portions of the kidney structure, always has arterial lesions in some part of the body. From our own observations these vascular disturbances appear to have developed concurrently with the nephritis, but they do not necessarily pursue a parallel course, for in some cases they out-distance the development of the processes in the kidney and in others they do not develop in comparable proportion. It would also appear that when

the multiple processes have once begun, a vicious circle is induced, the one diseased organ having a harmful effect upon the other.

It is during the development of these early renal and arterial lesions that hypertension makes its appearance. The increase in the arterial pressure cannot be the result of quantitative damage to the kidneys, such as occurs when large portions of the kidney tissue are removed by operation, for at this time the total loss in renal tissue is not great. Nevertheless mal-excretion by kidney and retention of waste products is already taking place and we cannot entirely neglect the possible effect of these. But an apparently much more important feature is to be found in the early injury to the arterial branches in all parts of the body. The insidious progress of vascular sclerosis does not permit us to recognize their presence until they are well advanced, and concurrently with the recognition of the diffuse arteriosclerosis we may observe the presence of hypertension and of chronic nephritis.

High blood pressure of itself does not indicate renal disease, for we may encounter definite and permanent renal disease in which little or no influence upon the blood pressure can be discovered. On the other hand also we meet with well advanced arteriosclerosis accompanied by high blood pressure but without renal disease, while on the other hand a generalized arteriosclerosis, although often associated with high pressures, may appear without a rise in blood pressure. Janeway, in a careful analysis of 130 patients with blood pressures over 200 found seventeen in whom no clinical evidence of renal disorder could be detected. He even goes further to find that the autopsy on pure hyperpietics may reveal no kidney lesion or one of insignificant kind.

Albutt states that the slight or variable degree or the absence of high blood pressure and cardiac enlargement in many cases of renal disease, when the kidney structure may have been disorganized to the extreme, has always been a puzzle to clinical observers. If the heart be enlarged to any great extent, some physicians assume that besides renal disease, some correlated disorder of a systemic kind must be associated with the renal disease. Others, with unconvincing proof, look for the determining factors of high arterial pressure in the differences of the renal elements involved, as for example the glomeruli, the parenchymatous degeneration, the quantitative destruction of kidney substance, or the absorption of products of disintegration arising within the kidney. It is conceded by most authors that the greatest effects inducing high pressures and cardiac enlargement occur in association with peculiar complex lesions of the kidney in which glomeruli, tubules, and vascular channels are all seriously involved in inflammatory fibrosis, and that those kidney lesions localized more particularly in the glomeruli or in the interstitial tissue of the tubules or in the arterial walls alone, do not as a rule have the severe consequences in the circulatory system.

Let us for a moment review what little is known of the etiology of these types of chronic nephritis,—and here I must say that in such an analysis we must keep apart the clinical conception of chronic Bright's disease from the pathologist's findings of chronic nephritis. Up to the present there is no parallelism in this terminology, and the day has not yet arrived, in spite of the claims of Vollhardt and Fahr, when we may draw accurate conclusions by clinical analysis as to the nature of the renal lesion; and more decidedly still, are we unable to deduct from the nature of the pathological lesions, as to the qualitative and quantitative perversions of the kidney functions during life. True it is, that in the advanced stages of disorganization, when evidences of increased blood pressure, or uræmia, and exaggerated renal incompetence are manifest, it is not difficult to suggest the character of the kidney damage. But to the pathologist these advanced cases of renal disease are of less interest, for in these late stages with involvement of multiple structures, there is little opportunity of reading the past history of the progress of the lesions.

There is one group of chronic nephritis which is clearly the outcome of bacterial infection. Years ago such cases were described by Councilman, and he indicated that not a few of them resulted in a glomerulo-nephritis with an accompanying inter-tubular reaction. In others again the localization of the bacterial damage was less pronounced in the glomeruli but was distributed in the interstitial tissue of the cortex and vascular zones. These lesions, which are seen associated with scarlet fever, measles, sometimes

following chickenpox, diphtheria, arthritis, and tonsillitis, are true inflammatory ones, and probably are related to the presence of organisms in the kidney substance itself. This forms a distinct group, characterized by the presence of an acute stage.

Then again there is the embolic lesion, occurring in heart disease, and less commonly in other bacteriæmias, in which the small capillary vessels of the renal cortex are sporadically plugged, giving rise to minute infarcts. These lesions are so unique and special that we need not further dilate upon them, as they do not play an important rôle in the development of chronic nephritis as we meet with it in later years. Fahr, Baehr, and others have fully described them.

Besides these there is a large group, and in fact it includes much the greater number of cases which are seen in adults in which the nature of the etiological factor is unknown and for which many hypotheses have been advanced. In the hope of throwing some light upon this obscure group, much experimentation has been carried out. These cases, as has been shown by Hill, may begin in childhood, and even at this early age show the chronic lesion. Pathologically it presents itself as a chronic glomerulo-nephritis, a chronic interstitial nephritis, or a chronic perivascular nephritis in each of which there is an accompanying tubular degeneration. Hill suggests that even these cases may have a bacterial origin, possibly associated with tonsillitis. However, at the time when they are encountered, nothing remains of the acute inflammatory state, and they are recognized only as accidental findings at autopsy or by mild or moderate manifestations of chronic Bright's disease during life. We have been surprised to observe that even in childhood, inflammatory processes in the renal structures, also leave some mark on the tiny vessels of the parenchyma. Undoubtedly many of these early lesions of the kidney escape our attention until the patient is well advanced in years. In how far these childhood lesions play a part in the production of chronic nephritis in middle life, we do not know. More attention, however, must be directed to them.

Again and again, it has been suggested that abnormal metabolic products injure the kidney structure, and when prolonged over years of time slowly lead to states of chronic nephritis. Up to the present nothing definite can be said in this regard, save admitting that it may be possible. The great bulk of animal experimentation which has been done during the last fifteen years upon nephritis, has attempted to prove that chemical substances of many kinds can produce degenerative lesions of the tubules when given in known toxic doses, but on the other hand may also produce peculiar selective lesions of special kidney tissues when given in very dilute quantities. For these purposes a great variety of substances such as arsenic, phosphorus, salts of mercury, lead, silver and copper, uranium nitrate, tartaric acid, oxy-butyric acid, aloin, cantharidin, saponin, snake venom, bacterial toxins, and many others, have been used. It has not been possible to draw many frank conclusions dealing with nephritis as seen in man, from these experiments; save this, that some poisons appear somewhat more selective in the injury induced than others, and that there are poisons which induce peculiar hyaline degeneration in the endothelial lining of the capillaries, and notably in the glomeruli. This being true, it allows us to suggest that the hyaline obliteration of the glomeruli as seen in some cases of human "nephritis," and which at times are unaccompanied by marked inflammatory products, may have been the result of a peculiar unknown poison, and not the end-result of bacterial attack. It is in this type of case in which the possibility of the effect of metabolic poisons must be most seriously considered. The most notable contributions upon the influence of chronic intoxication upon the kidney were made by Pearce, Ophüls, Christian, Karsner, and McNider. Unfortunately the term "vascular nephritis" was applied to the capillary lesions induced by poisons in animal experiments. This has been somewhat misleading, suggesting a relation to the manner of origin of the arteriosclerosis which is seen in the human kidney. There has been as yet no proof that the poisons influencing the capillaries of the glomeruli have any peculiar effect in bringing about arteriosclerosis.

In conclusion, there is no evidence that arteriosclerosis is a precursor of, or an essential factor in, the production of chronic nephritis, but rather that arteriosclerosis may make its appearance in the renal vessels in one of two ways; either as an independent arterial disease unassociated with the changes contained within the kidney structure (in which case it involves

the main renal arteries) or, it makes its appearance in the small arterioles of the renal parenchyma concurrently with lesions appearing in the glomeruli and inter-tubular stroma. These arterial lesions are likely the result of the same agent causing the inflammatory fibroses in the renal structure proper, and hence should be considered in conjunction with the kidney disease in general. Furthermore, the nature of the arteriosclerosis is not constant, at times consisting of intimal hyperplasia, endarteritis or degeneration; at other times consisting of medial hypertrophy; and at still others showing perivascular fibroses, as are encountered in chronic inflammatory processes.

Under these conditions, and depending upon the nature and extent of the arterial involvement, it assists in further deranging the functional activity of the kidney.

It is not uncommon to find that lesions comparable to those found in the renal arterioles are to be found simultaneously in the small vessels in many parts of the body.

ANATOMICAL CHANGES IN RELATION TO THE FUNCTIONAL DISTURBANCES IN "CHRONIC NEPHRITIS" MORE ESPECIALLY IN THE CONTRACTED KIDNEY TYPES*

HORST OERTEL, M.D.

Strathcona Professor of Pathology, McGill University, Montreal

WE are living in the age of cellular pathology, that is, the histosystem of the cell is the formal "entity" or "unit" of living substance, and all physiological as well as pathological functions are expressions of mechanical cell acts. These are released by, and with necessity follow, external physical agents, the irritants or stimuli. Cellular pathology, therefore, endeavours to explain the causal connections and the mechanism of diseased cell life.

But in all higher animals and in man, we are not confronted by individual cells or even by simple summations of cells, but with a structural organization of varied differentiation into specific territories, histosystems of superior order, as Heidenhain calls them. This organized combination of cells introduces new qualities, not inherent in the cell alone, and, therefore, new problems. These do not arise solely from the union of cells to aggregates, but from, first, their specific arrangement and construction into tissues; secondly, and dependent upon the first, from their positional relations, thus created; and, thirdly, from the diversities in morphological and functional differentiation. The importance of the plan and architecture of an organ in relation to its function has, therefore, been long appreciated in the study of normal anatomy and physiology. Thus one of the first questions we put to ourselves in the investigation of normal organs is not only what kind of cells enter into their formation, but how are these put together, how are they arranged, and what is the relation of the various tissue components to each other. For this construction of cells into a tissue system mirrors its function, often with surprising accuracy. Thus in the very organ which we propose to consider here, the kidney, Bowman, one of the earliest investigators into its function, based his ideas largely upon the anatomical arrangement of its components, and thus formulated a theory of urine secretion which even to-day is recognized as being, in its main concepts, correct.

In pathology, however, the importance of structural arrangement of whole organs, as compared and contrasted to the normal has, until quite recently, been much neglected

*Lecture delivered at Queen's University, Kingston, Ont., on Jan. 9th, 1925.

Pathologists rested content to devote their attention almost entirely to cell and tissue changes and thus histogenesis and pathogenesis were practically identified. While occasional attempts were made to go beyond simple cell and tissue changes, in tracing their effect upon the structure and function of a whole organ, such attempts remained isolated, limited, and were not elevated to a general method of investigation. Thus the standard by which pathological disturbances could be judged was almost entirely the extent and the quantitative effects of a particular lesion.

One reason for this lack of earlier attention to organic construction under pathological conditions was due to the technical difficulties, which were great. The reconstruction of organs by serial sections is a time-consuming, expensive, clumsy, and not always accurate method, and injections of the vascular tree of an organ, which, through demonstration of blood vessel distribution, generally gives us the key for its functional understanding, was until recently so difficult, uncertain and lacked so much uniformity and completeness, that it remained only partially applicable and also open to many errors. Thus, until about 1910, and even later, not much was done to obtain a real insight into a pathological organ as a whole. Nevertheless, the necessities for this became more and more pressing, and forced themselves very strongly upon me in the course of years, especially in the study of the diseases of the kidney. Here I had become convinced that at least some of the important functional derangements, more particularly in the slowly progressing, but persistent, clinically chronic, inflammations, (perhaps best exemplified by the so-called contracted kidneys) arise from certain new pathological qualities which are introduced in the course of, and by the inflammatory process. These qualitative modifications create a new pathological unit, which, as time goes on, is, for these reasons, further and further removed from the physiological sphere and from the community with other organs. I expressed these views many years ago (1908-1909), in the course of some lectures on Bright's disease which were delivered in New York, in these words: "The pathological organ is essentially a different organ from the normal. It presents more than simple alterations of physiological processes, in exaggeration, diminution, or abolition of certain functions which depend on corresponding organic changes. It is really incomparable to the normal organ from which it developed. Its whole architectural arrangement is changed by the formation of new tissue and the introduction of new cellular elements; its channels of nutrition, lymph, and nerve distribution become fundamentally altered; secretory ducts are lost; new ones are created; new cell types develop from the pre-existing parenchyma cells; in short, the pathological organ is a new one, characterized by tissues of its own and specific arrangement of its parts. No wonder, therefore, that it presents functional phenomena, which cannot be fully covered or explained by a direct application of the results of simple physiological experimentation and consideration derived from the normal organ."

"Here is a future field for pathological anatomy. It can no longer be satisfied to describe and disclose *tissue changes*, but it must construe the plan of the whole *pathological organ*. Only a knowledge of both will ultimately lead to an intelligent understanding of pathological functions of a whole organ, and establish a pathological physiology commensurate with the normal."

For external reasons further investigations into this matter were interrupted and could not be resumed until about 1915, in Montreal. The first question, of course, was to find a suitable, generally applicable and reliable method of organ reconstruction for pathological organs, comprehensive and visual, so that abnormal and normal organs could be readily compared. It seemed best for this purpose to select the construction and distribution of the circulatory tree. This, in its ramifications and peculiarities, is in the kidney of extraordinary interest and value, and a principal aid to a satisfactory understanding of both normal and abnormal kidney function. Thus it became first necessary to obtain an adequate idea of normal conditions.

The idea of renal circulation has been a traditional one for several generations, that is, the short, thick renal artery divides after entrance into the kidney into several branches which rise to the junction of cortex and medulla where they form arches (arcuate arteries). The latter give off arteries to the cortex

and some direct to the medulla. This last idea of direct medullary arteries (arteriæ rectæ) had already been shown to be erroneous by Huber, some years ago, who demonstrated their absence and that all blood passes, under normal conditions, first through the cortex, that is the glomeruli, before entering the medulla. The main parts of this older traditional view, however, remained and found their way into all text books of anatomy, histology and physiology.

At this point of investigation I was most fortunate to have associated with me Dr. Gross, who with rare industry and ingenuity devoted himself first, to invent a suitable method to demonstrate even the finer divisions of the arterial tree completely up to the glomeruli, and, secondly, to reconstruct by his method the whole renal circulation under normal and abnormal pathological conditions.*

I shall not go into the technique here, which may easily be consulted elsewhere, but simply state that his method and its success depend upon injections of a whole, fresh kidney, in a cabinet constructed for this purpose, with an injection fluid, after thorough transfusion (washing) with saline, under uniform pressure, regulated by a mercury manometer, and at body heat. In this way an excellent uniform, equalized injection of the whole kidney may be obtained. After experimenting extensively with all sorts of fluids and dyes, he obtained the most satisfactory results with injection of a barium emulsion, made of such viscosity as to permeate all vessels up to the glomeruli, *but not further.* The injection thus remains a complete, distinct, restricted, clear-cut arterial reproduction. Organs thus injected are radiographed in the usual manner, furnishing a photograph of the whole arterial distribution,† or they are cleared after hardening in alcohol by xylol or oil of wintergreen, which makes them transparent. (Spalteholz's method).

Within a short time one may obtain by this procedure a visual presentation of the whole renal circulation in a given case.

Dr. Gross applied his investigations first to the normal renal circulation and found the present traditional belief wrong; instead, as I can demonstrate to you here with lantern slides, the renal circulation resolves itself into a simple dichotomous division, like a spreading chestnut tree. These branches run at first between cortex and pyramids (interlobar) and break up rather acutely, in this manner transmitting high aortic pressure. Numerous end arteries run then intralobularly and from these final, glomerular branches come off at right angles. (Fig. 1).

FIG. 1.—X-ray photograph of barium injection in normal kidney. Notice dichotomous branching to smallest, glomerular vessels. Notice uniformity and equality in distribution.

But now we approached pathological alterations, and here we selected that interesting (inflammatory) dystrophy which offers most perplexing and curious functional deviations from the normal, that is, the contracted kidney, often referred to as chronic interstitial nephritis, better as "productive nephritis" for the reason that this long-continued "inflammation" is characterized anatomically by the extensive formation of new granulation and fibrous scar tissues which replace and gradually reconstruct a slowly, but persistently wasting parenchyma. It concerns itself, moreover, mostly with the secretory parts of the kidney, (that is, the parenchyma—glomeruli and tubules—of the cortex), while the medulla (or collecting parts) remains relatively intact. I need not go into the details of the finer tissue changes, because we are here concerned more with the problem of their effects on the whole kidney architecture. Suffice it, therefore, to repeat, what is well known to you, that in the contracted kidney types glomeruli and tubules are extensively extinguished, lost; the cortex, therefore, is correspondingly irregularly reduced and more and more of it replaced, and is consequently divided and isolated by scar tissue (granular contrac-

*It is not too much to say that Gross has thus opened an entire new and promising field of investigation which he and others have further extended to other organs with important results.

†Very beautiful results are obtained by stereoscopic photographs.

tion). These in short are the tissue changes, but what is their importance, that is, their effects on the organ as a whole, and consequently on its function as urinary entity? Here the reconstruction of its circulation, according to Gross's method, adds greatly to our understanding: In the first place, much, the bulk, of the blood stream is immediately short-circuited and passes directly to the medulla, as illustrated by these lantern slides of a typical case. The medulla, in contrast to the normal, forms nearly four-fifths of the whole secretory surface and *may be directly injected,* whereas in the normal kidney, where the injection fluid may only fill vessels as far as the glomeruli, this is not possible and the medulla remains clear, (Figs. 2 and 3).

FIG. 2.—Normal kidney injected with gelatine and carmine. Notice uniform injection of cortex to glomeruli. Medulla free from any injection fluid.

FIG. 3.—Contracted kidney injected with gelatine and carmine. Note injection of medulla and loss of cortical circulation.

The medulla takes over, therefore, the majority of what renal function remains and, largely with a blood supply which has not been modified by any previous cortical function or elimination. But, in addition, the whole architectural division and arrangement of the circulatory tree is reformed so as to constitute a new structural unit. That is, it is recast without co-ordination with the remaining secretory tubules, with which it maintains, under normal conditions, as is well known, intimate contact and connection. It is thus not only largely transferred to the medulla, but in this appears an apparently new and enlarged network of vascular channels which evidently represent a compensatory blood supply to the loops and collecting tubules. The increased vascularity of the medulla is, therefore, more than a mere mechanical deviation of the blood stream.* But even the remaining, older, larger vessels display many changes; they become unequal in length, uneven in bore, narrow quickly and are made unusually tortuous by

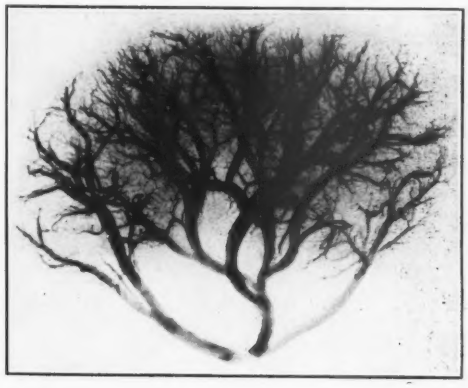

FIG. 4.—Circulatory injection (as above) in contracted kidney. Notice reduction in circulatory bed and unequal length, unevenness in bore and tortuous abnormal courses of vessels.

the cirrhotic environment, (Fig. 4). Consequently, throughout, *circulation* and *parenchyma* assume a *new pathological relation,* which is superimposed upon the quantitative reduction of their surfaces. *A new pathological organ quality is therefore substituted for the normal, which is lost.* It is interesting in this connection to compare and contrast the arterial injections in arteriosclerotic atrophy of the kidney with those of the genuine, inflammatory contracted kidney. The former only exhibits quantitative decline and loss of the circulatory bed, as a result of arterial obliterations. Consequently the whole arterial tree appears withered, gnarled, oak-like, with greater patches of extinctions, where infarctions have occurred, but there is no qualitative recasting of the circulation, as is typical for the inflammatory contractions. It is, therefore, erroneous to identify, as is still done in some text books, the inflammatory contracted and arteriosclerotic kidneys.

*Compensatory blood channels between the fat tissue in the kidney pelvis and their medullary circulation may also be noted. These changes may be observed with much clearness in stereoscopic photographs.

Far reaching as these circulatory alterations are, there remains another very important factor which concerns the remaining parenchyma of such a kidney. This has been interrupted, disconnected, isolated and distorted in its tubular course and connections by the growth of inflammatory granulation and fibrous tissue. It remains in insular isolations, without normal blood supply, in a pathological, strange environment. As a result, the secretory epithelium in the remaining convoluted tubules, which is normally charged with the bulk of secretion, regresses, as I discovered many years ago and confirmed by repeated observations, from high differentiation to a flat, low, endothelial lining (demonstrated by lantern slides), (Fig. 5). Other tubular parts (especially the loops) become tortuous, adenomatous.

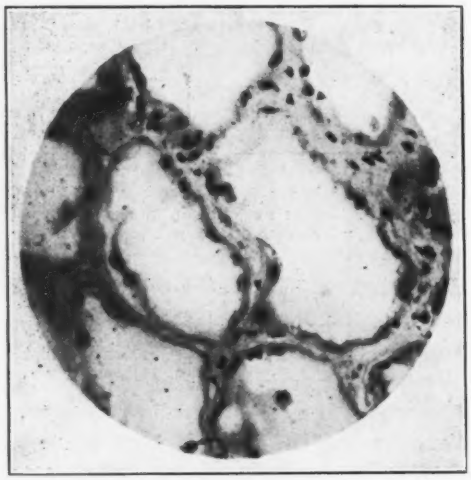

FIG. 5.—Microphotograph from a parenchymatous cortical island in contracted kidney. Abnormally wide and distorted convoluted tubules lined by low membranous epithelium.

Consider now these anatomical lesions in the contracted kidney as a whole, and in their bearings upon the functions of urinary secretion and elimination. Here the qualitative reconstruction looms at once larger than mere quantitative reduction. When we consider the two essential changes, altered blood supply and distribution, and loss and regression of secretory epithelium, we are in a position to form a more adequate conception of the resultant function.

For, in the first place, the remaining endothelial-like membranous lining of the tubules will much less readily, if at all, secrete the complex nitrogenous molecules with which it is normally charged. It has on the contrary all the appearances of a diffusion membrane, and one would on a morphological basis expect the urine from such tubules to be of a more or less transudative character. This is actually borne out by experience, as the quantity of urine secreted, even in advanced contracted kidney is high, but of low specific gravity. This descent in differentiation of the secretory epithelium furnishes an explanation of the most perplexing functional behaviour, that in this secretory organ (the kidney) the amount of secretion *rises*, while the secreting parenchyma is being *extinguished*, and its power of urine concentration fails! It is no longer a real secretion, but a transudation through a simple diffusion membrane. Moreover, these tubules are no longer faithfully followed in their course by a normal blood supply, but this has been transferred in altered (augmented) distribution to the medulla. Put these two morphological changes together, and you obtain renal insufficiency and perversity as their functional sum. It need not be emphasized that such a profound qualitative reconstruction in the renal unit must reflect strongly upon the whole economy of the organism and ultimately make life of the individual impossible.

I hope I have, although briefly and inadequately, and with very broad strokes, indicated how important the anatomical reconstruction of an organ is in relation to its functions under pathological conditions, and that this constitutes at present and in the future an important field of investigation to supplement, control, and enlarge our knowledge and understanding of pathological function. Only the ignorant believe that function may be investigated apart, and without reference to structure. Structure remains one of the most important pillars upon which reliable knowledge of function must always build and with which it must harmonize.

REFERENCES

OERTEL, *The Anatomic-histological Processes of Bright's Disease and their Relation to the Functional Changes*, W. B. Saunders Co., Phila. and London, 1910. OERTEL, The Classification of Nephritis, *Arch. Int. Med.*, 1913, xi, p. 653. OERTEL, Post-natal Development and Pathological Organ Reconstruction in Relation to Function and Disease, *Am. Jour. Med. Sc.*, 1921, clxi, 5. p. 694. GROSS, Studies on the Circulation of the Kidney in Relation to Architecture and Functions of the Organ in Health and Disease, *Jour. Med. Res.*, 1917, xxxvi, July, *ibid.* 1918, xxxviii, July.

CONGENITAL DILATATION OF THE URETERS

L. P. Lansdowne and William Boyd, M.D., M.R.C.P. (Edin.)

Winnipeg, Man.

SINCE the publication of an extremely comprehensive paper on the subject by Young, Frontz and Baldwin, in 1919, congenital dilatation of the ureters has received considerable attention from numerous investigators. The importance of recognizing the condition clinically is manifest when it is realized that, treated early by operative procedure, a successful outcome may be expected. Unfortunately, most of the cases reported have been seen or diagnosed too late, and as the state of the patient in an advanced stage holds little hope, the chief interest has been in the pathological findings at autopsy.

Symptoms.—The essential symptom is difficulty in urination in young male children. Comparatively rarely does the patient reach the age of ten years, although a case has been reported in which the condition was found at autopsy in a man of eighty-five, and Davis reports a case in which the symptoms did not make their appearance until after twenty years of age.

The urine may dribble away or there may be pain during the act. In some instances complete retention has occurred, in others retention followed by incontinence. The ordinary causes of such a sequence of events, namely, phimosis, or partial obstruction of the external meatus by a membrane, can of course be easily recognized and excluded.

Upon abdominal examination a rounded tumour in the hypogastric region, the filled or partially full bladder, is frequently found, and often the greatly distended ureters and hydronephrotic kidneys can be made out on palpation. Tenderness on pressure over the latter organs may be present. The increased intra-abdominal tension may bring about embarrassment of respiration, and difficulty in breathing may be observed.

Cystoscopy, or better, cysto-uretero-pyelography is of great aid in diagnosis; the obstruction may possibly be detected by the passage of instruments from below, usually, however, the passage in this direction is free. The presence of residual urine and dilated ureteral orifices is proof of obstruction in the urethra.

The foregoing account applies to the condition in the earlier stages. Later the picture is similar to that seen in far-advanced, neglected cases of prostatic obstruction, that is to say, chronic nephritis, and infection of the urinary tract. The child becomes wasted and anaemic. Diarrhœa and vomiting occur, and there is cardiac hypertrophy. The non-protein nitrogen of the blood is increased, the renal function as determined by the various tests, is decreased. Fever and chills are common, and leucocytosis is found on examination of the blood. The urine is laden with pus, and cystoscopic methods reveal the trabeculated bladder, and cystitis, and the infected ureteral orifices. Finally acidosis or uræmia may supervene.

It is in the early stages, before too serious damage to the kidneys has occurred that suspicion of a congenital defect in the urinary apparatus must be aroused.

Pathology.—The kidneys present the usual appearances of advanced hydro—or pyonephrosis, and in many cases the organ is reduced to a mere sacculated, fibrosed shell. The ureters are enormously dilated, often resembling more the bowel than the normal ureters. The lumen may measure 6 c.m. in diameter, and the walls are greatly thickened when inflammatory processes have been at work.

Although the disease is as a rule bilateral, single hydroureter due to obstruction by a fold at the ureteral orifice has been reported. Curiously enough, the left kidney and ureter have very often shown the most extreme dilatation.

The bladder is hypertrophied, with or without dilatation, and the wall is trabeculated. Cystitis is the rule, and peculiar changes in the lining of the bladder, consisting of replacement of the normal transitional epithelium by the tall columnar type, have been observed.

In all but a few cases, very definite abnormalities are met with in the posterior urethra,

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and as might be expected, they are such that some form of obstruction to the outflow of urine is produced. They include folds or valves, attached to or independent of the verumontanum, hypertrophy of the verumontanum, and hypertrophy of the internal sphincter. Except in the instances where no adequate pathology is discovered, or where the obstruction is due to the hypertrophied condition of the internal sphincter, the urethra above the defect is dilated, there is hypertrophy of the muscular coat and diverticula containing infected urine may be present.

The above mentioned abnormalities in the posterior urethra may now be considered in more detail.

1.—*Valves or folds in connection with the verumontanum.*—These are the most common form of obstruction, and are of two main types.

(a) From the inferior border of the verumontanum a ridge may proceed, dividing into two folds passing anteriorly, which find attachment to the whole circumference of the urethra

(b) Similarly, folds may pass upwards from the verumontanum towards the internal sphincter.

The arrangement of both these types of folds is such that an instrument can be easily inserted past them from below upwards, but when subjected to the pressure of urine from above, they balloon out like the valves of the great vessels leaving the heart, the concave surfaces being directed up, thus forming a very considerable source of interference to the outflow of fluid from the bladder.

2.—*Valve-like obstruction with no definite attachment to the verumontanum.* These valves consist of a fold of membrane attached to the whole circumference of the urethra, producing a complete diaphragm, with a small central perforation. To this form of obstruction, the name "iris valve of Jarjavay" has been given.

3.—*Hypertrophy of the verumontanum.*—The blockage may be caused by an enlarged verumontanum, which, without any folds or valves may exert a simple ball-valve action. The microscopic examination of such verumontana shows a simple hypertrophy, often with some desquamation of the mucous membrane. The latter feature is doubtless due to the infection which is almost invariably present.

4.—*Hypertrophy of the internal sphincter;* may be seen, comparable to other congenital stenoses. Several views as to the ætiology are held, but a theory which has received a good deal of credence is that which suggests as the cause, a neuro-muscular incoordination. With this may be included those cases in which no evident pathology is found. Fordyce and Capon hold the view that these cases are in all likelihood due to some lesion of the spinal cord, a slight hæmorrhage, perhaps, which leads to spasmodic contraction of the sphincter.

When so many varying conditions are met with, obviously several factors may enter into the causation of the anomaly, and indeed very little has been definitely determined as to the ætiology of any one of them.

The production of the valvular obstructions has received the greatest attention, on account of the relative frequency with which these structures have occurred in congenital obstruction. According to Bazy, the valves represent the remnants of the urogenital membrane, which in the embryo is found in the positions where the valves are most usually met. Lowsley believes that the condition arises as an anomaly of the terminations of the Wolffian and Mullerian ducts. Others consider them to be merely exaggerations of the normal striæ found in the floor of the urethra, or to be due to a chronic inflammation.

The most suggestive work, however, has been carried out by Watson. This observer has shown that between the thirteenth and thirty-first weeks of fœtal life, the glandular development of the verumontanum takes place. The verumontanum, which at the earlier of the two periods consists of a mass of undifferentiated mesenchymatous tissue, becomes potentially the organ found at birth, with glandular elements of mucous membrane, utricular, and prostatic origin. During the development, perhaps by some abnormal overgrowth, the increasingly cellular mucous membrane fills in the space between the tip of the verumontanum and the roof of the urethra. Then, probably by pressure from without, the mucosa becomes damaged and ulcerates leaving the stroma of the verumontanum in contact with the urethral roof, eventually producing a firm attachment of the two surfaces which later becomes modified into the valvular folds previously described.

The above theories doubtless account for many of the obstructive processes. Persistence

of the urogenital fold seems to explain the cases of the diaphragms which occur without attachment to the verumontanum, while Watson's theory seems to find some measure of confirmation in one of our reported cases.

The following histories serve to illustrate several types showing a different ætiology:

Case 1.—A boy, twelve years of age, was admitted to the Children's Hospital on August 24, 1923. For the last two years he has wet himself nearly every day, and has always wet the bed at night. He has otherwise been in good health, and has never suffered from headaches.

He was brought to the hospital on account of the trouble with urination. Physical examination showed that the heart was enlarged, the apex beat being 2 cm. outside the nipple line, the systolic blood pressure was 155, the diastolic 95. There was a considerable degree of tenderness over both kidneys, though these could not be palpated; a slighter degree of tenderness was present over the bladder, which was distended half way up to the umbilicus. The urine contained a large amount of albumen and much pus. The specific gravity was persistently low. The bladder contained four ounces of residual urine, in which *B. coli* were found in great numbers. The phenolsulphonethalein test was zero on three occasions. The urea content of the blood was 104 mg. per 100 cc.

During September, headache and vomiting made their appearance, but curiously enough, the pus in the urine diminished in amount. By the middle of October there was extreme pain and tenderness over the kidneys and ureters, so severe indeed that morphine was necessary. During November the symptoms of uræmia became intensified, the vomiting was frequent, but strange to say the blood urea fell first to 80 mgs. and then to 44 mgs. The urine became pus free; the blood pressure, however, rose to 182. At the beginning of December, the heart developed a gallop rhythm, the blood pressure mounted to 194, pus reappeared in the urine, and red blood cells made their appearance for the first time. Signs of ascites and pericarditis developed, followed later by pneumonia, and death occurred on December 20th.

The possibility that the case might be one of congenital obstruction of the posterior urethra with ascending infection of the urinary tract, was considered during life.

Autopsy Findings.—The left ventricle of the heart showed in a marked degree, the concentric hypertrophy characteristic of chronic Bright's disease. Other findings were recent pericarditis, lobar pneumonia, ascites, and enlargement and congestion of the liver and spleen.

The ureters were enormously dilated and very tortuous, (Fig. 1). They were 22 cm. long and when opened up, they proved to be on an average 6 cm. wide. A third of the way down the

FIG. 1.—Dilatation and tortuosity of ureters. Dilatation of pelvis of kidney. Hæmorrhagic condition of vesical mucosa. (Case 1).

right ureter there was a valvular fold. The kidneys were considerably enlarged, and were little more than bags of fluid. The pelvis and calyces of each kidney were extremely dilated, the pyramids were completely destroyed, and only a thin strip of cortex remained. The bladder was much dilated, the longest diameter measuring 8 cm. and the wall was about twice the normal thickness. The mucosa was covered by irregular, raised, dark red patches of varying size, but averaging 1 cm. in diameter. They were present everywhere save in the region of the trigone.

The commencement of the prostatic urethra was dilated and merged insensibly with the

cavity of the bladder. The verumontanum was of normal dimensions. From the lower end arose two thin membranous folds, (Fig. 2).

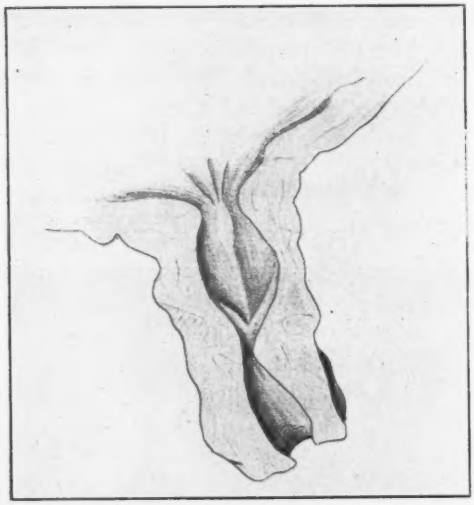


FIG. 2.—Sketch showing the membranous folds arising from the lower end of the verumontanum. (Case 1).

These curved outwards into the lateral walls of the urethra and apparently met on the roof, although the latter point could not be determined with certainty, for the urethra was opened along its upper surface. The concavity of this valvular fold was directed upwards so as to present an obstruction to the downward flow of urine. Before the urethra was opened, a probe was readily passed from below upwards, but when an attempt was made to pass it from below downwards, it encountered an obstruction in the prostatic urethra.

About 5 mm. below the membranous fold there was an elongated elevation on the roof of the urethra, the incision fortunately passing just to one side. This was 12 mm. long and of a bluish color. Microscopic examination showed that the elevation was due to the presence in the roof of the urethra of more or less rounded spaces filled with amorphous pink staining material, and lined by epithelium. The epithelial cells were tall and columnar, with the nucleus situated near the base, the superficial part of the cell being comparatively clear. The epithelium was of the transitional, rather than the simple columnar type, for the smaller cells could be seen wedged between the base of the main columnar ones. The epithelium was entirely different from that of the urethra which so closely adjoined it, and it resembled that of the prostate to such a marked degree that there appears to be little doubt that the entire structure represented a group of aberrant prostatic glands, which had become embedded in the roof of the urethra at a time when the verumontanum was in intimate contact with the urethral roof, a connection which Watson has shown may occur with more or less frequency.

Case 2.—A male child, two and a half years of age, was admitted to the hospital in a profoundly collapsed condition. He appeared to be suffering from some marked toxæmia, and was only partially conscious. No clear history could be obtained, but apparently the child had never been well; he had steadily failed in health, and had suffered from increasing abdominal discomfort. It was noticed there was progressive difficulty in micturition. He sank rapidly after admission, and died in the course of thirty-six hours.

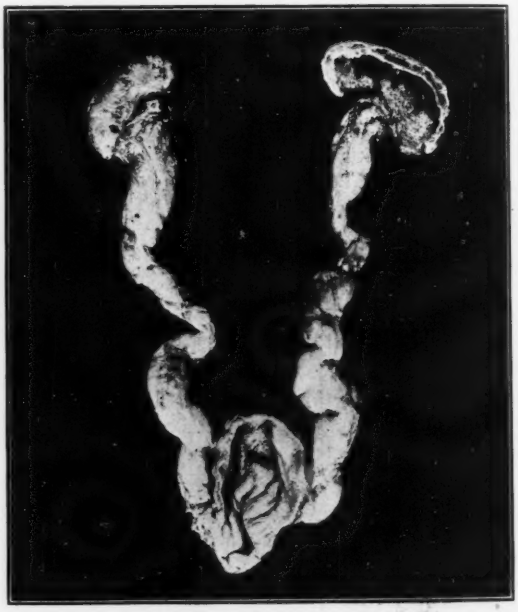


FIG. 3.—Dilatation and tortuosity of both ureters. (Case 2).

Autopsy Findings.—The general autopsy findings were similar to those of the case already described. The ureters were again taken for the ascending and descending colon. The pelvis of the kidney was greatly dilated and the

kidneys were converted into hydronephrotic sacs.

In the posterior urethra a valve-like fold extended from the lower end of the verumontanum on to the wall of the urethra on either side, and was carried upwards to the roof. The verumontanum itself was of normal dimensions. The roof of the urethra was quite smooth.

Case 3.—A child, three years of age, was admitted to the Children's Hospital for treatment of club foot, scoliosis, and deficiency of ribs, on October 23, 1923. He had previously been operated upon for spina bifida.

Little history was obtained, but the deformities had been present since birth. Apparently there were no symptoms referable to other systems than those dealt with by the orthopædic surgeon. The general condition of the patient was good.

Physical examination showed the scars of the former talipes operation, and that of the operation for spina bifida. The bony chest wall was deficient anteriorly in the regions corresponding to the sixth and seventh ribs. The latter rib was present behind, and divided into three portions, reaching the mid-axillary line. The eighth rib was bipartite. The sacrum was absent. The heart and lungs were normal. The right leg was small and weak, with the foot markedly inverted. There was little muscular control of the latter. The urine was acid, and contained a small amount of pus.

A cast was put on the affected foot, the patient remaining in the hospital until December, when he was discharged, still wearing the cast. The pus in the urine had not decreased in spite of potassium citrate treatment.

May 29, 1924, the child was readmitted, this time in rather poor condition, with the chief complaint incontinence of urine. Apparently, ever since the spina bifida operation in 1923, there had not been perfect control of the bladder. Before entry vomiting had occurred. Physical examination showed a greatly distended bladder. The child was catheterized and six ounces of sodium bromide run into the bladder. X-ray revealed a double hydronephrosis. Temperature 99.6°. Pulse 120. For the next two days the boy was drowsy and did not eat well. The pulse rose to 140. On June 2nd the leucocyte count was 18,000. The patient's condition was becoming worse. On June 4th a convulsion took place, the pulse was markedly irregular, and the rate rose to 160. Caffeine hypodermically improved this somewhat, but a few hours later death occurred. During the period the child was in the hospital, the urine on no occasion contained albumen, although the specific gravity was always low, and pus in small amounts were present. The blood pressure was 120/78.

Autopsy Findings.—Many congenital deformities were evident. The right leg was slightly shorter than the left and much less muscular. The chest displayed a remarkable deformity, for the anterior portions of the sixth, seventh, and eighth ribs were absent on the right side, giving rise to a great gap in the thoracic bony structure.

The lungs and pleura were normal. The heart was normal save for a small degree of hypertrophy of the wall of the left ventricle. No pathology was found in the gastro-intestinal tract.

The kidneys were fused together at their

FIG. 4.—Dilatation of both ureters. Horse-shoe kidney. Normal verumontanum. No urethral obstruction. (Case 3).

lower poles producing a horseshoe kidney. Both were considerably enlarged, and their pelves greatly distended (Fig. 4). The ureters were also dilated. The bladder showed hypertrophy and dilatation, and many hæmorrhages were present in the mucosa. No obstruction could be found at the ureteral orifices. The urethra appeared perfectly normal, there were no folds; the verumontanum was not enlarged; neither was there any hypertrophy of the internal sphincter.

The first two cases illustrate the type of condition described by Young, in which the obstruction is produced by membranous folds. Over thirty cases have been described, and the ætiology is fairly adequately explained by Watson's study of the development of the verumontanum.

The third case is perhaps of greater interest. Here one finds the defect in the urinary tract in association with a number of congenital anomalies, and it resembles closely the case reported by Fordyce and Capon, which they describe as "Idiopathic Hypertrophy of the Bladder." There is of course the possibility that some injury to the sacral cord occurred during the spina bifida operation, since the symptoms seemed to date from that time. In any case, whether the cord was injured at operation or merely suffered as the result of the congenital spina bifida, it appears highly probable that the centres co-ordinating contraction of the vesical sphincter were interfered with, that spasm of the muscle followed, and that the great dilatation of the ureters unaccompanied by any obstruction in the urethra is to be attributed to this cause.

Summary

Three cases of congenital dilatation of the ureters have been described. In two of these cases membranous folds in the urethra connected with the verumontanum were responsible for the dilatation. In the third there was no obstruction, but there was an associated congenital defect of the spinal cord.

Congenital dilatation of the ureters in male children due to obstruction in the posterior urethra is probably commoner than is usually imagined. Recognition of the condition is of importance in view of the satisfactory results following surgical removal of the obstruction.

REFERENCES

A very full bibliography is given in the paper by Young, Frontz, and Baldwin, so that only the recent references are mentioned here.

(1) BOYD, W., *Surgical Pathology*, 1925, 442. (2) BUGBEE, H. G. AND WOLLSTIEN, M., Retention of urine due to congenital hypertrophy of the verumontanum, *Jour. Urol.*, 1923, x, 477. (3) FORDYCE, A. D. AND CAPON, N. B., Idiopathic hypertrophy of the bladder, *British Journal Children's Diseases*, 1924, xxi, 1. (4) HANSMAN, A. H., Obstructions of the posterior urethra by congenital valves, *Boston Med. & Surg. Jour.*, 1924, exc, 12. (5) LOWSLEY, O. S., Congenital malformation of the posterior urethra, *Ann. Surg.*, 1914, lx, 733. (6) THOMPSON, G. S., Note on a case of hydronenphrosis with urethral septum causing obstruction to urinary outflow, *Lancet*, 1907, i, 506. (7) WATSON, E. M., The structure of the verumontanum. A study of the origin and development of its inherent glandular elements, *Jour. Urol.*, 1918, ii, 337. The development of the human verumontanum., *Bull. J. H. H.*, 1918, xxix, 241. The structural basis for congenital valve formation in the posterior urethra, *Trans. Sect. on Urology, Am. Med. Assoc.*, 1921. (8) YOUNG, H. H., FRONTZ, W. A., AND BALDWIN, J. C., Congenital obstruction of the posterior urethra, *Jour. Urol.*, 1919, iii, 289.

Generalized Edema Immediately Following Insulin Control in Diabetes Mellitus.—A pronounced generalized edema occurring in diabetic patients immediately following desugarization of the urine with insulin therapy was observed five times last year in the clinic, with which R. B. Gibson and R. N. Larimer, Iowa City, are connected. The edema promptly disappeared after treatment with potassium bicarbonate and potassium chlorid, 0.6 gm. each, three times a day, with meals. No recurrence of the edema has been reported by the patients when the potassium therapy was discontinued on discharge. None of the patients had significant renal or cardiac disturbances. The urines of all the patients were free from acetone and diacetic acid when the edema developed. That the edema may persist for thirty days if uncontrolled was shown for one case; potassium therapy was then instituted, and the edema almost completely subsided in thirty-six hours.—*Jour Am. Med Ass.*, Feb. 14, 1925.

A CASE OF AMAUROTIC FAMILY IDIOCY IN AN INFANT OF NON-SEMITIC PARENTAGE

THOMAS A. LEBBETTER, M.D., C.M.

Physician, Yarmouth Clinic Infirmary, etc., Yarmouth, Nova Scotia

THIS particularly rare condition is known in America as "Tay-Sachs Disease." It was first reported in England by Mr. Waren Tay who, in 1881, published an article (Tr. Ophth. Society of the United Kingdom, 1881) describing "symmetrical changes in the region of the yellow spot in each eye of an infant"; while to Dr. B. Sachs, of New York, belongs the credit of recognizing the disease and naming it amaurotic family idiocy. In 1896 he had studied and reported upon some nineteen cases. The disease is "characterized by an entire lack of mental development, a progressive weakness of all the muscles of the body and a rapidly developing blindness, with typical changes in the macula lutea. The disease is generally fatal, the patient dying as a rule before the end of the second year of life."

Etiology.—Nothing is definitely known regarding the etiology of the disease. Syphilis is not an etiological factor. The symptoms, however, of syphilitic cerebral disease may very closely simulate this affection. No determinable predisposing causes such as mental derangement of the parents, injury to the mother during pregnancy, etc. can be proven to have a direct bearing on the disease. That it almost exclusively occurs among the children of Jewish parentage is very apparent. Carter was the first to notice this racial predisposition, namely:—that the disease occurred, and that all the cases reported up to that time were among Hebrews. To further support this contention, Sachs[1] states that "even up to the present day not a single indubitable case has occurred among any other people."* A. Greig Anderson[2] writes "that the condition occurs exclusively in Jews. "Porter and Carter[3] further support this opinion by saying that "up to the present (1923) no authentic case has been reported which has occurred in an infant other than of the Hebrew race." Still[4] claims "its limitation is almost exclusively to the Jewish race." Robert Hutchinson[5] while explaining that cases of this disease are far from being common, further adds that "in all the recorded cases the children have been of Jewish parentage."

Griffith, Kerley, Dunn and Holt[6] are not as dogmatic in their pronouncements as the writers above quoted, the latter claiming that the disease is confined, almost if not entirely, to the Jewish race. In the few isolated cases reported as occurring in other than Jewish children the definite and diagnostic cherry-red eye spots have not always been present. Prof. E. Feer in *The Diagnosis of Children's Diseases*, (page 464) 1925 edition, says that "amaurotic family idiocy is almost unknown except in children of the Jewish race."

Ibrahim,[7] in the two cases which he mentions, stated, that the typical macula lutea phenomenon was lacking. Hoppe and Clay in *The Archives of Pediatrics*, June, 1923, report a case with all the typical signs and symptoms present as occurring in a Gentile female child age one year and seventeen days.

Histology and Pathology.—The brain and the spinal cord are the seat of the primary pathological changes. The entire brain substance is small and flattened. G. Marinesco[8], shows in four plates, that the course of the capillaries is strewn with glycogen granules which are disseminated at their surface, and states further, that, "an intimate relationship seems to exist between the gravity of the lesion and the deposit of glycogen." There is a definite swelling of the dentrites which, according to the investigations of Karl Shäffer, are so constant as to be pathognomonic. Quantitative and qualitative changes in the mitochondria are also found. There is a definite deterioration of the cell body and a swelling of the cell process exclusive of the axon. Histologic examination of

*In 1923, at a Research Association meeting, Sachs referred to two cases out of twenty-four reported by him which occurred in non-Semitic children. (Personal communication).

the eye shows, according to Holden, "a degeneration of the ganglion cells of the retina and of the nerve fibres of the optic nerve and tracts." The pyramidal cells become elongated and the nucleus is eccentrically placed. On the whole, the pathological changes are so extensive "that hardly one single pyramidal cell presents a normal appearance."

Symptomatology.—The first symptoms are usually noticed between the sixth and the tenth or twelfth months, until which time the infant has apparently been developing as a normal baby. No definite history regarding a difficult labour, nor instrumental interference has been recorded. The child has appeared to do well, to be normal in development and the first really abnormal condition observed may be a disinterestedness in his surroundings, and a lessened ability to become interested in his playthings or playmates. Then may be carefully noted the commencement of a gradual visual disturbance, which becomes progressively worse as he grows older, and ultimately ends in the tragic blindness of early infancy.

The parents may remark that the child does not hold up his head, nor sit up like he used to, and instead of advancing his condition seems to be retrograding, physically and mentally. The muscles appear flaccid. Attacks of bronchitis are not uncommon, but gastro-intestinal disturbances, which in infancy, follow as a complication of so many diseases are of infrequent occurrence. The ophthalmoscopic examination will now generally reveal the typical and diagnostic cherry-red spots described by Tay some forty-three years ago; month by month the severity of all the symptoms increases and a fatal termination occurs, generally before the end of the second year.

In connection with the diagnosis, it is quite reasonable to assume that in a child of apparently perfect health at birth, if he gradually loses his vision in the course of the first ten or twelve months of infancy; if he becomes listless and noticeably apathetic; if a noted paresis in his musculature is observed, particularly in that of the lower extremities; and finally, if, on examining the fundus, the cherry-red spots of Tay can be clearly seen in both eyes; if all these exist, then there can be no questioning the correctness of the diagnosis of Amaurotic Family Idiocy.

The case therefore which I am reporting is of great interest from two facts. First, from the rarity of the disease in eastern Canada, and second, from the fact of its occurrence in a child of non-Semitic parentage.

Considerable discussion has resulted among neurologists as to whether amaurotic family idiocy is an acquired or a congenital disease. Hirsch for example, in supporting the former claim, argues that it is due to a toxic agent and suggests some toxic substance in the mother's milk as the cause, while Shäffer, Sachs and others in defending the congenital theory say that the nervous system of the child is so inadequate, that, after functioning for a few months it gradually undergoes complete degeneration.

Case Report.—A male baby, white, aged twenty-two months, seen first on February 8th, 1924, at the Yarmouth Clinic Infirmary.

Complaint.—Blindness; cough; inability to use legs; drowsiness; semi-consciousness; inability to swallow liquids, etc.

Family History.—Father is a Nova Scotian fisherman, twenty-eight years of age, white, English, born in Nova Scotia, always lived there until twenty-one years of age when he went to the United States; after living in Boston for one and a half years working as a mechanic, went to sea. Two years ago he returned to Nova Scotia and has worked as a fisherman here ever since. During the war he served in the United States Navy for one year. His father, English, was born in the same county of Nova Scotia; he, too, was a fisherman, dying at age of seventy-one. His grandfather, Scotch, was born and dwelt all his life in the same part of Nova Scotia, and died at the age of eighty. He also had been a fisherman all his life time.

The mother is English, white, twenty-six years old, was born and has always lived in Nova Scotia. Her father is of English stock; is a hardy Nova Scotia fisherman, at present living in perfect health. Her mother is also living and well; is of Irish stock but was born and has always lived in Nova Scotia. The grandmother was also Irish, and she too, always dwelt in Nova Scotia. No record could be found of any family predisposition to nervous disorders, neither can there be established any trace of Hebrew blood going back four generations. The family were typical Nova Scotian fisherfolk, healthy, of English, Scottish, and more distant Irish extraction, and have lived for the past four generations in the same small fishing settlement on the Nova Scotian coast.

Previous History.—Mother has always been well; no previous illness. There are two children; this one, aged twenty-two months; the other, aged six months. This child was born full term, normal labour, on April 12th, 1922. Breast fed for two months, then given Nestle's food for one month, "because bowels were too loose." Weight on this food remained stationary, but the movements became healthy. Then given a food containing cow's milk and he began to gain, and gained steadily until twelve months old. Weight at birth seven and a half pounds. At end of first year weight seventeen pounds. First tooth cut at five and a half months. Had begun to form one or two words at ten months. Had influenza when eighteen months old. Ill for two weeks but made uneventful recovery.

Case of Amaurotic Family Idiocy, age twenty-two months, at Yarmouth Clinic Infirmary, Yarmouth N. S. Showing the very typical appearance of a child afflicted with this condition.

Present Illness.—When baby was ten months old parents began to notice a change in the child. Lost interest in things, and would not play with toys; seemed listless and apathetic. At five months he could sit up in bed but could not at ten months. The listlessness persisted for two months with no further symptoms observed. At twelve months the parents noticed a stiffness of the legs; both legs were held rigid and extended. This apparent inability to use his legs normally, or sit up in bed ordinarily, the lack of interest in his playthings and the increasing difficulty in seeing objects held before him, continued to increase slowly throughout the thirteenth to twenty-first month.

On February 5th, child was taken acutely ill. He had a troublesome cough, with considerable "rattling" while breathing, and the chest seemed "to fill up." He was not apparently feverish; he had no convulsions, no vomiting nor pain. The child seemed to become "dopy." The parents had noticed that he did not seem to observe objects held directly before him. A diagnosis of meningitis was made by the local physician, and the child was admitted to the Yarmouth Clinic Infirmary, February 8th, 1924.

Physical Examination.—A very acutely ill male child, twenty-two months old; weight 25 lbs. 4 ozs.; head circumferenee, 18.7 inches; chest 18.5 inches; well nourished; face mask-like; lies in recumbent position; is stuporous and does not respond to questions; unable to observe objects held directly before him; pupils do not react to light nor accommodation.

Head.—No tenderness nor abnormalities in contour; anterior fontanelle closed; no discharge from ears, the membranes are normal.

Eye.—The following is the report of a special examination of both eyes, carried out by Dr. C. K. Fuller, F.R.C.S., in charge of the Eye, Ear and Throat Department of the Yarmouth Clinic Infirmary. "*Right eye*: Irregular rotary nystagmus; pupils dilated; no reaction to light; *fundus*: optic disc round and pale; vessels normal; retinal veins slightly congested. In the region of the macula is a cherry-red circular spot about 3 mm. in diameter on a white circular background about 8 mm. in diameter. Findings in left similar to those in right eye."

Mouth.—Tonsils normal; pharynx normal; swelling of glands in right posterior triangular group.

Chest.—Expansion normal and symmetrical; no beading, nor dullness on percussion; profusion of moist bubbling râles on both sides which disappear after coughing spasm.

Heart.—Normal. Pulse rapid but regular; no enlargement; no murmurs.

Abdomen.—Normal in outline; no masses palpable; liver and spleen not enlarged.

Urinalysis.—Specific gravity 10.15; no sugar, albumen, or casts.

Neurological Examination.—Pupils as described above. No Kernig or Brudzinski's sign present; muscles flaccid; knee jerks exaggerated slightly; no spasticity.

Lumbar Puncture.—No increased pressure; fluid clear; no increased cell count; other findings normal.

Blood count is normal. Temperature 100° to 102° F.; pulse 90 to 100 to 130; respirations variable in frequency, 25-29-39-50; child unable to swallow liquids; can be roused, but fluids regurgitated out of corners of mouth. Child grew progressively worse and died February 11th, 1924, 6 a.m.

Diagnosis.—Amaurotic family idiocy.

Summary

The above report presents the history and collected notes regarding the symptomatology and course of a case of Amaurotic Family Idiocy occurring in a child of Anglo-Saxon parentage. A review of the literature shows very few instances of the disease occurring in children other than of Jewish parentage.

Bibliography

(1) Sachs, B., Possey and Spiller, The Eye and Nervous System, *Osler's Modern Medicine*, vi, 532. (2) Anderson, A. Greig, *Oxford Medicine*, Oxford Univ. Press, vi, 246. (3) Porter, L. and Carter, W. E., *The Management of the Sick Infant*, C. V. Mosby, p. 325. (4) Still, G. F., *Common Disorders and Diseases of Children*, 4th Edit. *Oxf. Med. Pub.*, p. 679. (5) Hutchinson, Robt., *Lectures on Diseases of Children*, Longmans, p. 285. (6) Holt, L. E. and Howland, *Diseases of Infancy and Childhood*, D. Appleton & Co., 7th Edit. p. 78 (7) Ibrahim, Z., *Cushman's Text Book of Nervous Diseases*, P. Blakiston's Son & Co., ii, 786. (8) Marinesco's, G., Amaurotic Idiocy and Decerebrate Rigidity, *Encephale*, 1923, xviii ,145.

A CASE OF CIRRHOSIS OF THE LIVER IN A CHILD FOURTEEN MONTHS OF AGE

O. J. Day, M.B.

Demonstrator in Pediatrics, University of Manitoba

Attending Pediatrist, Children's Hospital of Winnipeg and Grace Hospital, Winnipeg

Physician to Out-Patient Department, General Hospital, Winnipeg

CIRRHOSIS of the liver of any type in a child excites interest; Hanot's cirrhosis in an infant of fourteen months is a rarity. All the text books on pædiatrics and medicine emphasize this. Griffiths[1] says that he has personally seen but two cases, one aged eleven years of the atrophic type and one aged six years of the hypertrophic type. Feer[2] mentions that "Rare cases of Hanot's cirrhosis of uncertain origin have been reported." Holt[3] mentions cirrhosis in infancy as exceedingly uncommon but that a considerable number have been reported in children from seven to fourteen years by Howard[4], Laura, and Honorat. These statements are confirmed in Abt's *System of Paediatrics,* Nelson's *System of Medicine* and Allbutt and Rolleston's *System of Medicine.* Abt[5] describes the clinical picture of a female child of two years which closely resembled the case under discussion, but differed in the fact that jaundice in his case was early and intense, and that there was no purpuric rash or other hæmorrhage.

Hypertrophic or biliary cirrhosis or Hanot's disease, is characterized clinically in the adult by its long duration, although in the child it runs a more rapid course, by the presence of jaundice, enlargement of the liver and spleen, attacks of abdominal pains(pxrexia, and by the absence of persistent ascites or signs of portal obstruction.

The distinctive features of the disease were recognized by Hanot in 1876. Prior to that there was a difference of opinion as to the relation between the hypertrophic and atrophic forms of the disease, many holding that the former was a stage in the evolution of the latter. Some writers of the present day express doubt as to the existence of the hypertrophic form. Its great rarity and tendency towards "mixed" forms may explain this opinion.

Males are the more frequent sufferers among the adults in the proportion of about 2:1. Morley Fletcher[6] records that thirteen were male and seven female in a series of twenty-two juvenile cases.

The disease is commonest between the age of twenty and forty years while the atrophic form is commonest over forty years. It is unquestionably rare in Europe and America but there is a form of cirrhosis which is endemic in India and Mexico which has many of the characteristics of Hanot's cirrhosis but differs in its shorter duration, and absence of splenic enlargement. These cases frequently are seen in infancy and they may be due to some specific cause.

Heredity sometimes appears to be an influencing factor in the causation of biliary cirrhosis. "Family" forms have been described. The influence of alcohol in the etiology is probably nil. Syphilis itself produces a multilobular type of cirrhosis but not the

biliary form. Tuberculosis is not responsible for the disease. Some cases have been reported to have followed specific fevers, typhoid fever, malaria, and pyogenic infections. That biliary cirrhosis must be a result of some toxæmia is our nearest solution of the cause, and in our case we cannot suggest any more satisfactory explanation.

The diagnosis should not be hard to make, but until jaundice became noticeable in our case, we hesitated to call it cirrhosis but tried to differentiate between Von Jaksch's anæmia, malignancy, hydatids,, enlargement of the liver of gastro-intestinal origin, syphilis, and splenic anæmia.

The prognosis is hopeless. So also is the treatment, whether medical or surgical.

M. S., a female child aged fourteen months, was admitted to the Children's Hospital on August 28th, 1924. She was born and always lived on a farm. Her parents were of German origin. The father was aged thirty-seven years, the mother thirty-three years. Both were in good health and had never been ill. There had been four pregnancies, two boys aged eleven and eight years, and two girls, one aged three years and the patient.

This baby was born at full term, her birth weight was eight pounds. Her delivery had been easy and without instruments. From her birth she had made good progress and was a well nourished, contented, vigorous child whose development had not been interrupted by any illness. She had been nursed from birth till the present time, exclusively till she was ten months of age and then bread, arrowroot, oatmeal, porridge and potato were added to her diet. She sat up at six months and walked alone at one year. Her first teeth appeared at seven months.

Her mother was considering weaning her when she realized that the baby was ailing. The onset of this illness was insidious, about six weeks prior to her admission, when she was scarcely thirteen months of age. It was then noticed that the baby was not so energetic, was listless, often irritable and easily fatigued, and showed a greater desire to sleep. She ceased to walk and appeared to be losing weight though this fact was not confirmed by actual weighing. On July 20th, about a week after the mother realized that the child was unwell, a rash appeared on the scalp and within a few days spread over the neck and trunk, but not on to the limbs. It was most profuse on the back and at the time of admission had the same appearance as at the beginning except that there was a fine superficial desquamation. Her appetite failed and her bowels became constipated. She would frequently cry out suddenly with pains which seemed to be referred to her abdomen and were colicky in character. Her loss of weight became daily more obvious. She became more anæmic and the distension of the abdomen was considerable.

Physical Examination.—On admission; weight eighteen pounds eight ounces, length twenty-seven inches. A very pallid, apathetic infant moderately well nourished but showing evidence of a recent and considerable loss of weight; well developed. The rash on her head, neck and trunk was dark red, irregular and macular. It was purpuric. Otherwise the skin was decidedly pale. The mucous membranes were pale. *Head*: Seventeen and a half inches in circumference, fontanelle open, admitting the tip of one finger, no craniotabes, no bossing. *Eyes*: Sclerotics were clear, pupils reacted normally. *Tongue*: Clean; mucous membranes, tonsils and posterior pharynx and nose normal. She had twelve teeth. No lymph nodes palpable except in groins. Heart was normal in size and position; there were no murmurs. The lungs were clear.

Abdomen.—Was enlarged, measuring twenty and a half inches in circumference. The liver was exceedingly large and reached to within one inch of the crest of the ileum with the baby lying on her back. Its margin was sharp, and through the emaciated abdominal wall, one could feel underneath its edge throughout its whole course. The organ was firm, smooth and not tender. The spleen was also enlarged, and was nearly the size of a tennis ball. It was also firm, smooth and not tender. There was an excessive amount of gaseous distension but no free fluid could be made out.

Bones and joints: The joints were lax. The only evidence of the bony changes of rickets was a slight beading of the ribs. Nervous system: Objective findings were all negative.

Laboratory investigations:

	Aug. 28	Sept. 1	Sept. 10
White Blood Cells	10,125	13,750	17,900
Polymorphonuclears	39	38	22
Small Lymphocytes	52	55	74
Large "	5	3	3
Eosinophiles	2	1	1
Transitionals	2	1	

Red Blood Cells, 3,290,000; Hæmoglobin (Tallquist), 80 per cent; Blood Wassermann, negative; Throat swabs negative for Klebs Loeffler bacilli; Blood cultures, sterile; Urine on repeated examinations was normal; bile and bile pigments were absent; Von Pirquet, negative.

Progress Notes.—The baby was in hospital for two weeks on this occasion. During this time she continually ran a low grade fever 99°-100° F., pulse 110-120 per minute, and respirations 20-25. Her mother nursed her, and though she never seemed hungry she sometimes got as much as seven ounces. Her condition was unchanged at the time of her discharge which was an unavoidable circumstance; her weight was the same as on date of admission. and as the diagnosis was by no means certain we asked for her return.

She was readmitted on October 6th, 1924, having been home four weeks. During the latter half of this period she had not done well. On examination it was discovered that a considerable change had occurred. The process of weaning which had been commenced in hospital was completed during her absence and she was on a general diet of undiluted milk, green vegetables, fruits, cereals, broths, and egg. At first she appeared to be doing well but in the last week she became weaker, was losing weight, refusing her food and her abdomen was greatly enlarged.

Physical Examination on October 6th.—The purpuric rash was more profuse while the skin showed a definite icteric tint and the sclerotics were decidedly jaundiced. The enlargement of the abdomen was no longer due merely to the liver and spleen for there was a large quantity of free fluid in the peritoneal cavity. The liver was of the same consistency and smooth and its hard, sharp edge was just as readily felt, but it extended only two inches below the costal margin. The spleen was barely palpable. Veins were to be seen on the abdominal wall. There was decided œdema of the feet; less of the hands.

The child was very apathetic and would not resist or cry out when disturbed for examination; would only take about half her food even with urging and always languidly; was always drowsy and slept a great deal of the time. She suffered no pain and there was no itchiness.

On three occasions, on October 13th, 15th and 23rd, a paracentesis of the peritoneal cavity was done and from ten to twenty ounces of fluid were withdrawn on each occasion. A considerable quantity of fluid continued to ooze from the last puncture wound.

Laboratory findings:

1.—Examination of the fluid from the peritoneal cavity: Colour, amber, slightly turbid; Sp. Gr., 1015; Albumen, 1.5 per cent; Microscopic: many leucocytes, no bile. Culture, sterile.

2.—Von Pirquet repeated, negative.

3.—Wassermann repeated, negative.

4.—Urine showed presence of bile.

5.—Stools, normal in colour and consistency, offensive odor.

6.—Van den Bergh—delayed direct reaction.

7.—Phenoltetrachlorphthalein liver function test revealed all the dye absent from the blood in one hour.

Red blood cells October 20th, 3,030,000; October 28th, 2,040,000; Hæmoglobin, 60 per cent; White blood cells October 28th, 23,400; Polymorphonuclears, 38 per cent; Lymphocytes, 62 per cent.

Her asthenic state became more pronounced as time went on. The petechial hæmorrhages were more numerous but there was no hæmorrhage from any other source even from the onset. Her temperature had been quite normal till the last week when it was constantly between 95 degrees and 98 degrees. Her pulse rate was unchanged during the whole period, registering 110-120. Her respirations were between fifty and sixty for the last week and many moist râles were audible at both bases, but there was no change in the percussion note or in the quality of the breath sounds. The œdema of the extremities increased, the abdominal distension was often extreme. This was due to flatus. The icterus was quite deep. She died on November 1st. An autopsy was performed by Dr. William Boyd.

Autopsy.—The body is that of a female child showing œdema, which, however, is least marked in the face. The thighs and legs on both sides are extremely œdematous and swollen, the former measuring 21.5 cm., and the latter 20 cm. The arms are much swollen, the skin being very flabby, but no definite pitting on pressure could be demonstrated. The abdomen is extremely distended. Numerous small bright red petechial spots are to be observed on the skin covering the abdomen, the thorax and the back, and to a lesser extent on the upper limbs and the neck. The entire skin and the conjunctivæ are of a slightly yellow tint.

The *heart and lungs* present no abnormality, nor do the pericardial or pleural cavities contain any fluid.

The *peritoneal cavity* is completely filled with a perfectly clear fluid of a bright greenish-yellow colour. The mesenteric fat has entirely disappeared, and the omentum is no longer spread out in the normal apron-like fashion, but is rolled up and plastered along the transverse colon. In the region of the hepatic flexure the mesentery presents a peculiar appearance, for numerous fine vessels injected with blood can be seen passing between the ascending colon and the parietes, as if an attempt were being made to establish a collateral circulation. Considering, however, that this is the region where the abdomen was tapped for the purpose of removing the fluid, it appears more probable that this is merely a vascularization of young adhesions formed as the result of the injury produced by the needle. A similar condition, although less marked in degree, is present in a corresponding position on the left side.

The liver is moderately enlarged, weighing 374.5 grams, and measuring 19 cm. in its longest diameter. Its shape is regular and it is of firm consistency. The external surface, which is of a greenish colour, is quite smooth. The cut surface presents a mottled appearance, being made up of minute red areas surrounded by zones of a greenish-yellow colour. The portal tracts are unusually distinct, and are surrounded by an abundance of fibrous tissue. *The gall bladder* is filled with a clear bile of normal appearance. The bile ducts are patent and present no abnormality.

The *stomach and intestines, spleen, kidneys, adrenals, pancreas, and pelvic organs present no abnormality.*

Microscopic examination of the liver shows a considerable degree of atrophy of the liver cells, with great distension of the blood capillaries. The principal change, however, is in the portal tract. There is a great proliferation of the bile ducts, many of which are irregularly formed. Around these newly formed ducts is an abundance of young fibrous tissue, but this fibrous tissue does not show any cellular infiltration nor other evidence of recent inflammatory reaction. The cirrhosis is naturally monolobular in type, but the fibrous tissue does not tend to surround the lobule, being confined to the region of the portal tract.

Microscopic examination of the other organs show no abnormality.

Conclusion. — The patient, aged fourteen months presented all the characteristics of an adult case of biliary cirrhosis, namely: jaundice, enlargement of the liver and spleen, attacks of abdominal pains, pyrexia. Unusual features were the presence of a large amount of ascites and a persistent petechial rash. The whole course of the disease lasted three months.

"The cirrhosis is monolobular in type, with a great proliferation of the bile ducts, many of which are irregularly formed and surrounded by an abundance of young fibrous tissue."

No solution as to the etiology could be determined.

REFERENCES:

(1) GRIFFITHS, J. P. CROZER, *Diseases of Infants and Children*, i, 273. (2) FEER, *Paediatrics*. Sedgwick & Scherer, 1922, p. 339. (3) HOLT, L. E., *Diseases of Infancy and Childhood*, p. 440. (4) HOWARD, *Archives of Paediatrics*, 1899, xvi, 330. (5) ABT, I. A., *North-Western Medical Clinics*. (6) FLETCHER, Morley, in Allbutt & Rolleston, *A System of Medicine*, part 1, iv, p. 185.

Gentian Violet in Subacute Infective Endocarditis.—R. H. Major reports a case of recovery from subacute infective endocarditis following intravenous injection of gentian violet. The patient, a woman aged twenty-five, was very anæmic, the red corpuscle count being 3,320,000 per c.mm., and the white corpuscle count 3,650; the temperature was 100° F., and a non-hæmolytic streptococcus of the *S. viridans* type was recovered in a pure culture. The temperature fell to normal after the intravenous injection of 5 mg. of gentian violet per kilogram of body weight, in a 1 in 500 aqueous solution. The blood culture subsequently was found to be sterile, and a second injection of gentian violet was given forty-eight hours later. In all, four intravenous injections were given, and no blood cultures after the beginning of treatment contained streptococci. The patient was discharged much improved; the red blood corpuscles had increased to 4,500,000 per c.cm., and the white corpuscles to 7,000 per c.mm. Seven months after discharge from hospital the patient was in good health, although a loud systolic murmur was still audible at the cardiac apex. During one of the injections the gentian violet was extravasated into the tissues and set up a necrosis with sloughing, which caused considerable discomfort to the patient; this cleared up, however, without any severe complications. Major suggests that the success in his case might well induce the further trial of gentian violet in patients with a more malignant type of the disease.—*Jour. Am. Med. Ass.*, Jan. 24, 1925.

OBSERVATIONS ON THE USE OF DIHYDROXYACETONE IN THE TREATMENT OF DIABETES MELLITUS

(Preliminary Report)

I. M. Rabinowitch, M.D., C.M.

With the assistance of Althea B. Frith and Eleanor V. Bazin

From the Department of Metabolism, Montreal General Hospital, Montreal

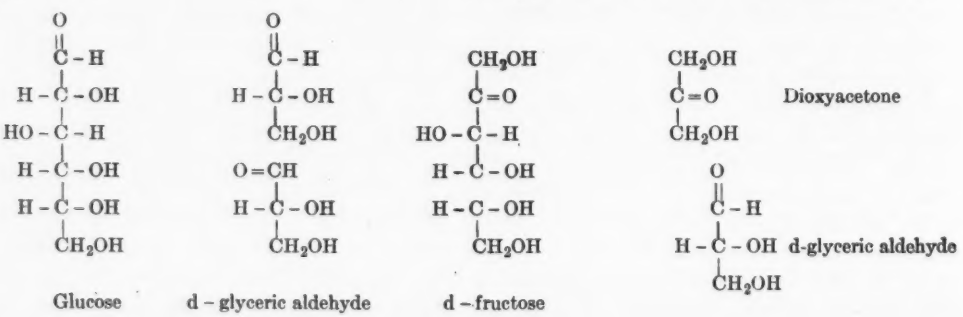
Dihydroxyacetone, $\begin{matrix}CH_2OH\\ C=O\\ CH_2OH\end{matrix}$ is a white crystalline substance with a sweet, cooling and slightly astringent taste. It dissolves slowly when triturated with one part of water at 20° C. and readily in greater dilution. It is a keto-triose, and like the other trioses, d and l glyceric aldehyde, is very unstable in alkaline media, readily undergoing rearrangement and condensation. It is readily oxidized. Polymerization is also noted to occur when, in solution, it is heated above 60° C. It is non-toxic when taken by mouth in the usual doses for sugar. No manifestation of kidney damage (albuminuria, suppression of urine, etc.), have been noted to occur as have been, following the administration of the aldoses, d and l glyceric aldehyde. Different results are recorded in the literature regarding fermentation. The product used in this investigation could not be fermented by fresh yeast. Dioxyacetone is optically inactive.*

Theoretical considerations.—It may be stated, generally, that in a diabetic, glycosuria is produced because of a disproportion between the rate of absorption of glucose from the alimentary canal or rate of production in the body, and the rate at which it is oxidized or stored. The failure to oxidize or store is probably partly due to failure of the necessary chemical transformations of the sugar molecules between the glucose phase and that representing their complete oxidation, namely, carbon dioxide and water.

There is much experimental evidence that the trioses, d and l glyceric aldehyde and dihydroxyacetone, are products of the normal chemical transformations. Thus Emden, Schmidt and Wittenberg[1] picture the cleavage of glucose and fructose as shown in chart below.

Von Lebedew and Griaznoff[2] also regarded that dextrose is first split into dioxyacetone and glyceric aldehyde. According to Buchner and Meisenheimer[3] dihydroxyacetone is the first disintegration product obtained during the fermentation of glucose . Numerous such examples may be found in the literature on the subject of the intermediate metabolism of carbohydrates. These hypothetic cleavage products may either be oxidized or reunited and retransformed into glucose, and subsequently glycogen, and stored in the liver. All trioses when administered to a phlorhizined dog are completely converted into glucose (Lusk[4]).

*For more detailed chemical and physical properties see *Bioch. Handlexicon* (Abderhalden) 2. Band, 270 (1911).



An attempt has been made to employ the two aldoses, d and l glyceric aldehyde, in the treatment of diabetes[5]. Both have been found wanting. Any decrease in the excretion of sugar or acetone bodies noted could apparently be attributed to impairment in renal efficiency caused by these substances. Dioxyacetone has received little consideration. Though not an aldose, it has been assumed it would have, practically, the identical properties of the other trioses.

Emil Fischer first suggested the therapeutic use of dioxyacetone. This suggestion was based purely upon chemical consideration and attracted apparently little clinical attention. At that time it was obtained by bacterial action on glycerine and the quantities available were obviously insufficient to permit anything in the nature of an extended clinical trial.* Recently, some of the physiological properties of this substance have been investigated[5]. In animals glycogen storage in the liver was found to be greater for given doses of dioxyacetone than for glucose. In healthy subjects a lowering of the blood sugar was noted following the administration of 60 gms. and no marked hyperglycæmia was noted following the administration of 150 gms. In diabetics similar results were noted, and in only severe cases was there noted a hyperglycæmia and this was less marked than when glucose was given.

The value of a product of such physiological characteristics in the treatment of diabetes is obvious. This applies especially to the severer type of diabetic requiring insulin. If the diabetic individual could more readily tolerate dioxyacetone than glucose, relatively, more of the former could be given. If its caloric and antiketogenic properties approximate those of glucose more fat could then be given without a tendency to disturb the body weight and the antiketogenic balance. Since more food could be given, less insulin would be required. This was tested by clinical and laboratory observations.

Blood sugar time curves were first obtained in normal individuals and then in diabetics. The usual procedure was followed. A blood and urine specimen were first obtained in the post-absorptive state. The dioxyacetone was then given, and blood and urine specimens were obtained 30, 60, 120 and 150 or 180 minutes later.

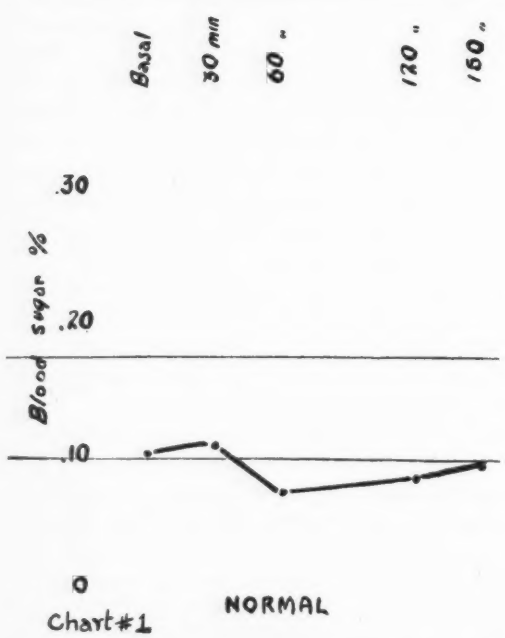
Methods.—The blood sugar estimations were made by Myers-Benedict method, and the urine sugars by employing the same principle. After preliminary removal of interfering substances with blood charcoal, the urines were suitably diluted, saturated with dry picric acid and filtered. The picric acid filtrate was then treated in the same manner as in the case of blood. As a result of a large number of experiments with this procedure, the dioxyactone used here has been found to have an average of 1.53 times the reducing capacity of a corresponding concentration of a solution of pure glucose. Dioxyacetone was qualitatively detected in the urine by treating the latter with an equal quantity of the copper reagent employed in the Folin and Wu[7] blood sugar method. If dioxyacetone is present the reduction of the copper solution becomes apparent *at room temperature* within five to thirty minutes. In the case of blood, dioxyacetone was qualitatively detected by treating the clear tungstate filtrate (Folin) with an equal quantity of the above copper reagent, after making the filtrate slightly alkaline with 5 per cent NaOH.

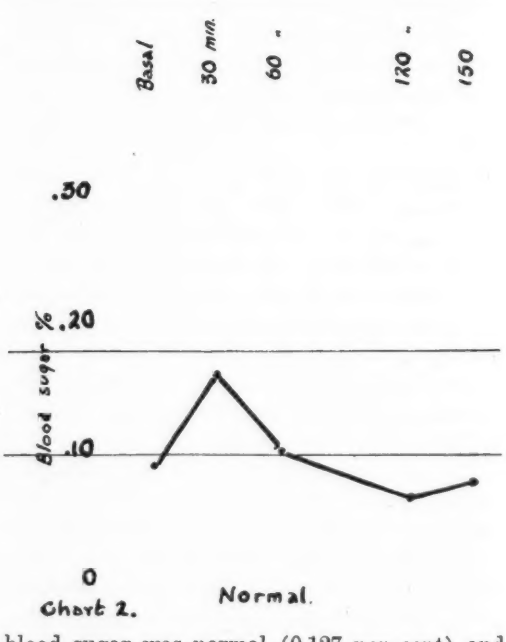
In normal individuals, within one hour following the oral administration of 50 gms. dioxyacetone, either the usual, or an insignificant increase in the blood was noted, as in the case of glucose. Following this, the blood sugar decreased and at the end of three hours, still remained below the level originally noted in the post-absorptive state. Dioxyacetone was detected qualitatively in the urien. The threshold, if there be one, is thus apparently lower than that for glucose. Examples of results in the case of normal individuals are recorded in the following table. These are graphically recorded in charts 1 and 2.

In the case of diabetics, curves were obtained from patients with varying degrees of severity of the disease, but under control and having either only a slight or no hyperglycæmia in the post-absorptive state. In each case, for comparative purposes, a dioxyacetone and glucose curve were obtained on separate days.

*The dioxyacetone used in this work was made by Farbwerke v. Meister Lucius & Bruning, Hoechst a Main, under the trade name of "Oxantin." The writer is indebted to the Mallinckrodt Chemical Works, Ltd. for the free supply of this product during this investigation.

Subject	Time	Blood Sugar Per cent.	Urine		Remarks
			Vol. cc.	Benedict Sugar Reaction	
1. Laboratory Worker (D)	Basal	0.102		0	
	50 minutes after	0.109	90	+	Dioxyacetone reaction positive
	60 minutes after	0.078	50	+	" " "
	120 minutes after	0.088	70	+	" " "
	150 minutes after	0.098	95	+	" " "
					Total sugar excreted 0.38 gms.
2. Laboratory Worker (G)	Basal	.092	85	0	Dioxyacetone reaction positive
	30 minutes after	.161	25	+	" " "
	60 minutes after	.108	20	+	" " "
	120 minutes after	.066	205	+	" " "
	180 minutes after	.078	120	0	
					Total sugar excreted 0.49 gms.





Case No. 5258.—Mild. Discharged on a diet of 30 per cent above the basal caloric requirement, with the urine free of sugar and acetone bodies and the blood sugar normal.

100 gms. of dioxyacetone were given with the following results:

	Blood sugar %
Before administration	0.103
30 minutes after administration	0.145
60 minutes after administration	0.165
120 minutes after administration	0.173
180 minutes after administration	0.165

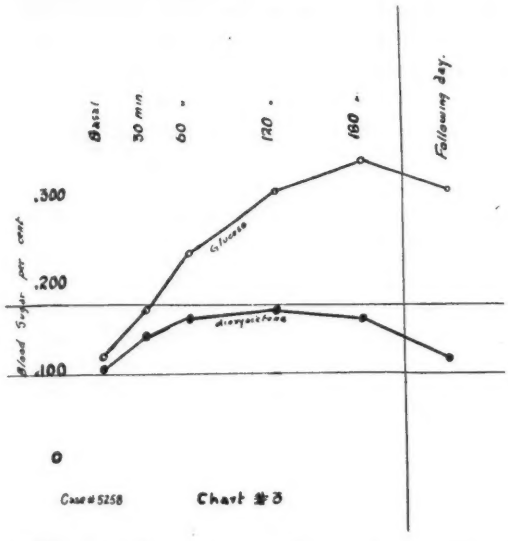
The total sugar excreted during this period amounted to 0.73 gms. The total for the entire day was 1.32 gms. The following morning the blood sugar was normal (0.127 per cent) and there was no sugar in the urine.

100 gms. of glucose were then given with the following results:

	Blood sugar %
Before administration	0.127
30 minutes after administration	0.176
60 minutes after administration	0.238
120 minutes after administration	0.312
180 minutes after administration	0.344

The total sugar excreted during this period was 3.8 gms. The total for the days was 19.6 gms. The next moring the blood sugar was .320 and the urine contained sugar.

The results are graphically recorded in Chart 3.



Thus, in the case of glucose the excretion of sugar was greater and the hyperglycæmia was more marked and persistent than in the case of the dioxyacetone.

Case No. 5233.—A mild diabetic discharged on a diet of 45 per cent above the basal caloric requirement, with the urine free of sugar and acetone bodies and the blood sugar normal.

100 gms. of dioxyacetone were given with the following results:

	Blood sugar %
Before administration	0.126
30 minutes after administration	0.140
60 minutes after administration	0.160
120 minutes after administration	0.190
180 minutes after administration	0.208

Here there was noted a gradual rise in the curve, reaching a 0.08 per cent increase in three hours. (0.12 to 0.20 per cent). During this period only 1.6 gms. of sugar were found in the urine, and the urine for the entire period of the rest of the day contained only 0.5 gms. sugar.

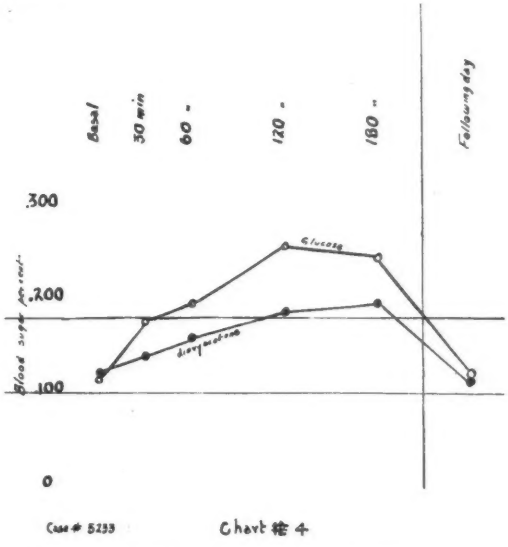
The following morning, in the post-absorptive state, the blood sugar was again normal (0.116 per cent).

100 gms. of dioxyacetone were given with the following results:

	Blood sugar %
Before administration	0.116
30 minutes after administration	0.178
60 minutes after administration	0.196
120 minutes after administration	0.256
180 minutes after administration	0.250

Here again it will be noted that the blood sugar curve had reached a higher level in the case of the glucose than when the same amount of dioxyacetone was given. During this three-hour period 9.9 gms. of glucose were excreted and the total sugar excreted for the day was 13.5 gms. The following morning, in the post-absorptive state, the blood sugar was, however, again within normal limits.

The results are graphically recorded in Chart 4.



Case No. 4966. — Severe diabetic. Glucose tolerance (Woodyatt) (in the absence of insulin) G = 46 gms.

On a diet of 50 carbohydrates, 150 fat and 50 protein (G=94), 35 units of insulin a day were required. On this diet and with the same amount of insulin the urine was kept sugar free and the blood sugar, in a post-absorptive state, was slightly increased (maximum-minimum variation 158 to 0.169 per cent). A blood sugar time curve was obtained following the administration of 50 gms. of dioxyacetone, with the following results:

	Blood sugar %
Before administration	0.158
30 minutes after administration	0.181
60 minutes after administration	0.211
120 minutes after administration	0.187
180 minutes after administration	0.187

It will be seen that the maximum rise noted was 0.15 to 0.21. On the morning of the test no insulin was given. During the period of the test 0.38 gms. of sugar were excreted in the urine. The noon and evening meals, preceded by 10 units of insulin in each case, were then

given. The total food value for the day, including the dioxyacetone, was 82 gms. carbohydrates, 100 gms. fat and 33 gms. protein. The remaining part of the twenty-four hour specimen of urine contained no sugar. The blood sugar the following morning was practically the same as on the day previous to the test (.160). The total value for "G" for the day of the test was 111.0. Thus it appeared that the patient was able to take 17 gms. more of "G" than the day before, though the dose of insulin was reduced from 35 to 20 units. A factor to be considered here, however, is that of the effect of starvation. Though only of a mild degree, by eliminating the breakfast, the total food value for the day was diminished by approximately 390 calories, in spite of the caloric value attributed to the 50 gms. of sugar given during the test. A corresponding curve was obtained the next day with 50 gms. of glucose with the following results:

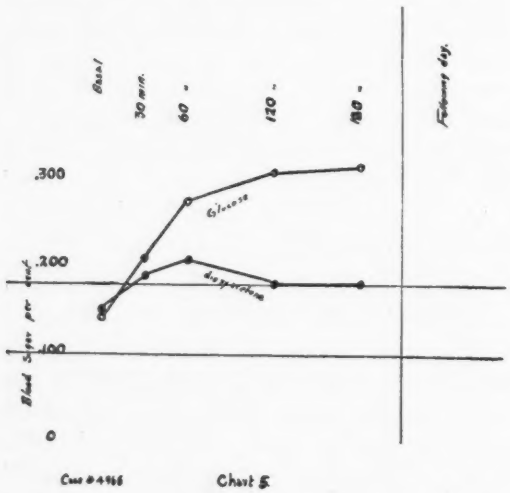
	Blood sugar %
Before administration	0.150
30 minutes after administration	0.212
60 minutes after administration	0.276
120 minutes after administration	0.311
180 minutes after administration	0.319

During this period 7.2 gms. of sugar were excreted and 8.4 gms. the rest of the day. Insulin was given with following meals, and the blood sugar the following morning was again within his usual range of variation.

The results are graphically recorded in Chart 5.

The slight excretion of sugar in the case of dioxyacetone as compared with glucose, could hardly be attributed to the same phenomenon as in the case of d and l glyceric aldehyde, namely, renal damage (suppression of urine). In none of the cases studied was there any albuminuria, nor other evidence of renal damage (urea retention, &c.) noted.

Blood sugar time curves were obtained in four untreated cases on the morning following their admission to the hospital. In each case there was a marked degree of hyperglycæmia and glycosuria in the post-absorptive state. In each case 25 gms. of dioxyacetone were given. The increase in the blood sugar above the basal value, noted in three of these cases, was not greater than that found in normal individuals. In one case a slight, though definite, decrease was noted. In each case, with one exception, the total amount of sugar excreted during the two and a half or three hours following the administration of the dioxyacetone was less than the amount excreted during the hour prior to the administration. It thus appeared that dioxyacetone had some influence on the excretion of glucose. The following table shows the combined data. These are graphically recorded in Charts 6, 7, 8 and 9.



Case #4466 Chart 5.

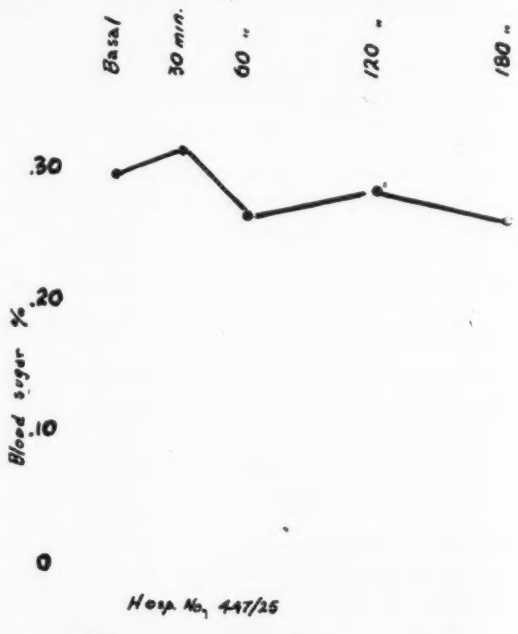
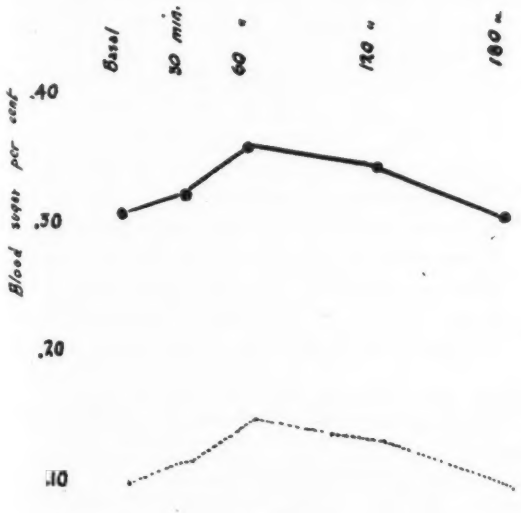


Chart #6

Case No.	Time	Blood Sugar %	Urine cc	Urine %	Urine gms.	Remarks
447	Basal	0.300	200	4.2	8.4	Total for 1 hour before.
	30 minutes after	0.327	38	2.5	1.77	
	60 minutes after	0.270	28	2.1	1.67	
	120 minutes after	0.293	65	2.8	2.35	
	180 minutes after	0.271	100	1.0	1.55	
					7.34	Total for 3 hours after.
4939	Basal	0.312	120	6.6	7.92	Total for 1 hour before
	30 minutes after	0.333	50	4.4	2.20	
	60 minutes after	0.357	35	2.9	0.91	
	120 minutes after	0.344	85	2.4	2.04	
	180 minutes after	0.302	110	1.8	1.98	
					7.13	Total for 3 hours after
468	Basal	0.256	165	3.8	6.27	Total for 1 hour before
	30 minutes after	0.285	175	2.1	3.67	
	60 minutes after	0.336	115	1.6	1.84	
	120 minutes after	0.285	175	0.61	1.06	
	150 minutes after	0.290	175	0.83	1.45	
					8.02	Total for 3 hours after
523	Basal	0.287	215	7.0	15.1	Total for 1 hour before
	30 minutes after	0.363	70	5.9	4.1	
	60 minutes after	0.360	40	7.0	2.8	
	120 minutes after	0.331	40	6.4	2.5	
	150 minutes after	0.338	45	5.5	2.5	
					11.9	Total for 3 hours after



Case #4939 Chart #7

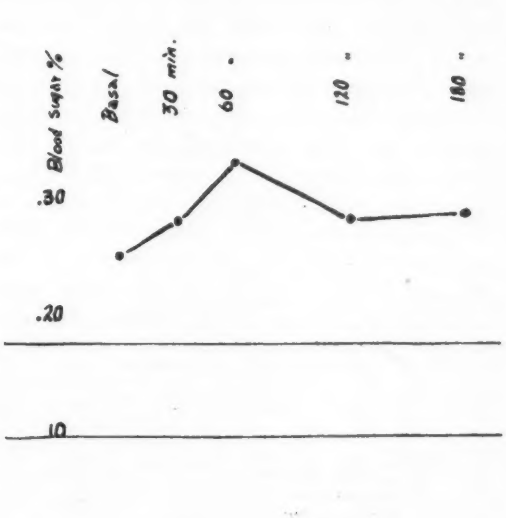
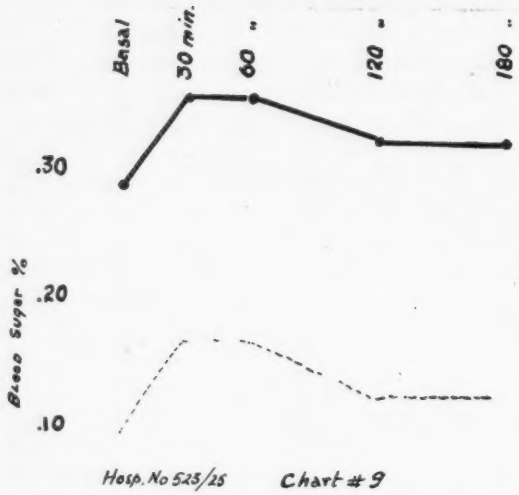


Chart #8 Hosp. No. 468/25



That dioxyacetone may be retained after the limit of tolerance for glucose is reached, is suggested by the following case:

Hosp. No. 447.—Male, age twenty-seven years. Service of Dr. A. H. Gordon.

On January 31st on a "basal" diet of 48 gms. carbohydrates, 150 gms. fat and 50 gms. protein, the total excretion or sugar for twenty-four hours was 93.1 gms. There were acetone bodies in the urine, and the nitrogen metabolism was increased (12.6 gms.). The blood sugar in the post-absorptive state was 0.322 per cent. The low tolerance (Woodyatt "G") is obvious. The following day 10 gms. of dioxyacetone were given every hour for twelve hours (120 gms.). No insulin nor other food was given. The sugar excretion fell to 21.3 gms. and the acetone bodies decreased. During the next two days, the same treatment was continued, the sugar excreted for twenty-four hours was 26.3 and 17.8 gms. respectively. The degree of hyperglycæmia on these days in the post-absorptive state was 0.294 and 0.320 per cent respectively. An explanation of this decrease in the excretion of sugar may have been that it was due to starvation alone, the patient having received no other food. The patient was then replaced on the basal diet. The glycosuria increased daily, and within five days (on February 8th, 1925) the patient was excreting 81 gms. of sugar per day. Acetone bodies in the urine had reappeared. On the following day, 45 gms. of dioxyacetone were added to the diet. The excretion of sugar, however, for that day was 90 gms. Even assuming that the excretion of sugar would not have further increased on the basal diet alone, the body had apparently retained 36 gms. of the added sugar. The acetone bodies had slightly decreased.

Simultaneous blood sugar and respiratory quotients curves were also obtained. Since the quotients obtained from oxidation of acetone bodies may simulate those of carbohydrate, fat and protein, no patients excreting these bodies were utilized for the purpose of these observations. The standard technical procedure for this work was followed and the usual precautions taken to minimize the numerous sources of error, increased pulmonary ventilation, etc. One curve is recorded in the following table. This it will be noted was obtained from the same individual whose blood sugar time curve is recorded (Case No. 5258).

A definite rise in the R.Q. and an increase in the total metabolism is noted. Both were maintained throughout the period of observation. The R.Q. at no time reached the value of 1.00. Thus, evidence of oxidation of the dioxyacetone given was obtained, but at no time was there any evidence that the latter was supplying the total energy requirement. The calculations for the total sugar oxidized was the same as formerly used.[8] Fifteen per cent of the total metabolism was attributed to protein and deducted. The remaining calories, assumed to be derived from the carbohydrates and fats were apportioned according to the Zuntz and Schumberg tables as modified by Williams, Riche and Lusk. In spite of the possible fallacy of assuming a definite metabolism for protein and short

Time	*Blood Sugar %*	*R.Q.*	*Cal. per Hour*	*Cal. from CO H and Fat*	*Cal. from CO H*	*GMS. CO H*
Basal	0.103	0.706	78.79	.....	.....	.....
30 minutes after	0.145	.....	.....	.....	.....	.....
60 minutes after	0.165	0.773	87.17	74.09	16.15	4.07
120 minutes after	0.173	0.817	89.69	76.23	29.58	7.47
180 minutes after	0.165	0.753	82.32	69.97	10.49	2.64
						14.18

period experiment the results appear significant.*

Substitution of dioxyacetone for insulin.—If dioxyacetone has the same food and antiketogenic value as glucose and is more readily tolerated than the latter, it should be possible to lessen the dose of insulin. This was tested. The following case demonstrated that at least for a period of time dioxyacetone can replace small amounts of insulin.

Hosp. No. 294/25.—Male, age nineteen years. Service of Dr. Campbell Howard.

On December 29th, 1924, the patient was discharged from the hospital on a diet of 53 gms. carbohydrates, 148 fat and 48 gms. protein. The case was regarded as one of the severe type. On 25 units of insulin a day (15 in a.m. and 10 in p.m.) the urine was kept sugar free and the blood sugar normal (0.111 per cent). The weight was 119 pounds. The patient returned to the diabetic clinic one week and two weeks later. On each occasion the urine was sugar free and on the last visit the blood sugar was normal (0.100 per cent). On January 20th, 1925, he was readmitted for treatment with dioxyacetone. He was kept on the same diet and dose of insulin until January 24th, and on this day the carbohydrate content of the diet was lessened by 10 gms. Twenty gms. of dioxyacetone were then substituted for this and the evening dose of insulin was discontinued. During the following nine days (January 24th to February 1st inclusive) the urine remained sugar free and the blood sugar normal. The body weight was unchanged and there were no acetone bodies in the urine. On February 22nd the remainder of the insulin, 15 units, was discontinued. During the next four days the blood sugar increased and glycosuria reappeared. Ten units of insulin were then given daily and the urine again became sugar free and the hyperglycæmia decreased. It would appear that, for the present at least, in this case, dioxyacetone replaces the use of 15 units of insulin.

*The results of a more analytical study of the R.Q. and total metabolism are now in preparation for publication. The similarity between some of these and those obtained by Joslin in the case of lævulose is striking. It may be noted that dioxyacetone is one of the hypothetical cleavage products of lævulose.

This appears to hold also in the case of more severe diabetics who, though aglycosuric on insulin, still have mild degrees of hyperglycæmia in the post-absorptive state (0.15-0.16 per cent), as the following case demonstrated:

Hosp. No. 5477.—Male, age forty-eight years. Service of Dr. F. G. Finley.

In this case the diet consisted of 51 gms. of carbohydrates, 175 fat and 53 proteins. On this diet with the use of ten units of insulin twice a day, the urine could be kept sugar free, but there was a persistent, though mild, hyperglycæmia in the post-absorptive state (0.15-0.16 per cent). By substituting 15 gms. of dioxyacetone for 15 gms. of carbohydrate in the diet, it was found possible to diminish the evening dose of insulin (10 units).

No one method of procedure has as yet been found suitable for all individuals.

This applies especially to the partition of the total daily dose required, and the time of day it should be administered. Individuals given small doses at frequent intervals, apparently tolerate much more than when the total allowance for the day is divided between the three meal periods only. The readiness with which dioxyacetone is oxidized at room temperature, and the ease with which it may undergo rearrangement and condensation even in slightly alkaline media, may be the possible explanation of this phenomenon. Owing to the fact that polymerization takes place when solutions are heated above 65° C. these are to be sterilized by the fractional process. In spite, however, of the difficulties encountered, the results obtained appear sufficient to stimulate further study of the use of this product.

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REFERENCES

(1) EMDEM, SCHMITZ AND WITTENBERG, *Zeit. f. Phys. Chem.*, 1913, lxxxviii, 210. (2) VON LEBEDOW AND GRIAZNOFF, *Berichte der Deutsch. Chem. Gessellsch*, 1912, xlv, 3256. (3) BUCHNER U. MEISENHEIMER, *Berichte d. Deutsch. Chem. Gessellsch*, 1910, xliii, 1773. (4) LUSK, *The Science of Nutrition*, 3rd ed., 1919. (5) WELLS, *Chemical Pathology*, 4th ed., 1920. (6) ISAAC AND ADLER, *Klin. Woch.*, 1924, iii, 1208. (7) FOLIN, O. AND WU H., *Jour. Biol. Chem.* 1920, xli, 367. (8) FINLEY, F. G. AND RABINOWICH, I. M., *Quart. Jour. of Med.*, 1924, xvii, 260.

RADIATION IN THE TREATMENT OF BENIGN DISEASES OF THE FEMALE PELVIS*

G. E. RICHARDS, M.B.

Chief of Department of Radiology, Toronto General Hospital

Associate in Radiology, University of Toronto

VERY early in the use of x-rays as a therapeutic agent the influence which these rays may exert upon the ovary was recognized, and since those early experiments much additional information has become available, and many controversial points have been cleared up. There still remain a few of the latter, but in general the physiological effect of x-rays and radium upon ovarian tissue is fairly well understood.

Effect upon the ovary.—The most sensitive tissue in the ovary, and indeed, probably in the human body, is the mature or maturing ovum and Graafian follicle. Exposure of such tissue to either form of radiation will produce damage to the ovum ranging all the way from temporary devitalization to complete destruction of the ovum. If we accept the standard of dose-measurement now in use, the skin "erythema," it is found that the ovary is from three to five times more sensitive than other tissues of the body, and the amount of radiation required to completely abolish its function is about forty per cent of a unit skin dose. A somewhat smaller dose than this would in all probability destroy all of the fully mature Graafian follicles with their ova, but there would still remain primordial or immature follicles in the ovarian substance which would not be destroyed nor materially devitalized. In a period of months or even of years these would develop, and in their turn become perfectly healthy and fully matured ova.

By a properly arranged system of dosage, therefore, we should, theoretically, be able to affect ovulation by destroying only the superficial layer of fully matured ova, and thus cause the patient either to miss a few periods or to have a diminished menstrual function for a time; or, secondly it should be possible by a further extension of the dosage factor to influence deeper layers of the ovarian tissue, thus causing cessation of ovulation for a longer period of time; or, finally by a full exposure of the whole ovarian tissue it should be possible to completely and permanently destroy all the primordial follicles in the ovary, and hence bring about permanent amenorrhœa. As a matter of experience all of these theoretical considerations may be fulfilled, and upon this fact much of the usefulness of these methods depends.

Effect upon the uterine tissue.—It is probable that upon perfectly normal uterine tissue there is very little effect from radiation either from x-rays or radium. But one of the best known properties of both of these agents is their depressing effect upon cells when in a state of activity or hyperplasia, and the frequency with which this condition in some form or other is met with in the uterus offers a field of wide application for both. Thus, in hyperplasia of the endometrium radium is of value though there are several methods which are probably preferable to it; in hyper-function of the glands of the cervix (leucorrhœa) radium again offers an agent which will destroy these glands and cure the condition in a majority of cases; in fibroids as will presently be shown the effect upon the proliferating cells can be little short of spectacular.

PART I.—*Bleeding in Young Women.*—Reference is here made to simple excessive menstruation in the absence of any organic disease and usually occurring in young women or girls. It is not within the scope of this paper to attempt any discusseon of the ætiology of this condition; its relation to disturbances of the endocrine system; nor its treatment by any other method than radiation. The type of case usually referred to the radiologist has already received a fairly prolonged course of such treat-

*This is the first paper of a series on the "Influence of Radiation in the Treatment of Disease."

ment, and is of such a nature that additional help is required. This is available in two different forms; viz: radiation of the pelvic organs direct and, secondly, radiation of other organs.

Several writers have drawn attention to the very decided possibilities in the latter procedure, and unless the patient's condition is such that no time can be lost, we believe the method of choice is to apply the treatment first to the thyroid gland and over the spleen before subjecting the ovaries to any radiation. By this method a few cases will be brought under control, and a normal menstrual function established. In the only cases in which we have personal experience, the treatment required to be repeated many times, and the percentage of successes was much smaller than in the older method. Aikins has reported favourable results from radiation by radium over the spleen in these cases. Benefit would probably be greater if the thyroid were radiated by x-rays at the same time as the spleen is being radiated by radium, and this procedure is at present being tried out. No reports are available over a sufficient period.

If the above method fails or is not sufficiently successful we proceed to apply the treatment over the ovaries and uterus directly. To ensure a successful result one should explain to the patient exactly what is being attempted since her co-operation is essential.

It is most desirable that the treatment be administered immediately following a menstrual period, but if no definite period can be established one may safely disregard this rule, and proceed as follows: First treatment.—The lower abdomen is marked off into two areas bounded above by a line joining the crests of the ilia, below and to the outer side by the curving line of Poupart's ligament and joining each other at the mid-line of the body. Over each of these areas an x-ray exposure is given which is estimated to be (or, preferably, known to be by accurate measurement) 10 per cent of a skin erythema dose (at the ovary). It is our practice in these cases to use the so-called modified voltage method as distinct from the high voltage. Under these conditions it has been found satisfactory and safe to use the following factors: Spark gap, 7 inches; milliamperes, 5; filters, 3 mm. aluminum, time -5 mins.; distance, 10 inches. At the first sitting this treatment is applied to each of the areas described above. The patient is instructed to report back immediately after the next menstrual period. If, (as will probably be the case), there has been no material improvement in the amount of bleeding we administer the second treatment. This differs from the first in that at this time the ovaries are both carefully protected, and a beam of x-rays is accurately directed upon the uterus *only* through a central area two inches wide by four inches in length. The actual dose is the same as before.

In this manner exposures are directed alternately upon the ovaries and uterus after each period. As a rule after the second or third treatment the excessive flowing will be materially diminished, and as soon as this occurs the treatment should be discontinued for a time. Very carefully it may then be repeated until the function is normal.

By this method we have succeeded in restoring a practically normal function in over twenty cases. The treatment has been applied in several patients in whom one ovary had been removed, and with no undesirable result to the remaining ovary. Other cases have been treated in whom the results have been somewhat disappointing, and in at least two cases in older women an amenorrhœa was produced which has remained permanent up to the present. This possibility constitutes the only danger, and in women over thirty is a very real consideration. Under that age the risk rapidly diminishes, and with careful technique, if the treatments are not repeated too often, even if an amenorrhœa is produced, it will probably be temporary.

In suitable cases the above procedure provides an excellent means of controlling this very difficult condition. It is, we believe, superior to radium in that it can be very easily done, without hospitalization, anæsthetic, or instrumentation. In girls and young women it is almost entirely safe in the dosage given above. After thirty the danger is greater, and greater care should be exercised. Here it may be well to administer treatment only after each alternate period, but by a suitable modification the method may be made applicable to almost any type of case coming within this grouping.

PART II. — *Menorrhagia*: *Fibrosis Uteri.* —

For sake of brevity we include under a common head all cases of excessive bleeding in women at or near the menopause (in the absence of a neoplasm).

Many articles have been written upon this subject during the past ten years or more, and yet there still seem to be those who doubt the value of the procedure, or who regard it as being still in the experimental stage. The fact cannot be too strongly stated, that there is probably no therapeutic procedure which is so certain in its effects, and so satisfactory in the vast majority of cases, as the use of x-rays or radium in this type of disturbance of the menstrual function.

It is not necessary to recall to the mind of the average medical practitioner the disastrous effect of prolonged, excessive bleeding upon the health of a woman at this time of life. When this loss continues, as in the past it has often done, for several years the patient is exsanguinated, anæmic, completely exhausted in her physical health, and frequently in her nervous and mental health as well. Curetting the uterus has been repeated on such patients several times with but temporary relief, and in many hysterectomy is at last resorted to as the only sure means of controlling the hæmorrhage. Under such circumstances the mortality rate following such an operation is necessarily high.

With the means now at our disposal all of this is entirely unnecessary, and we fail to see any reason why a woman should be permitted to bleed herself into a state of chronic invalidism from which she can only recover over a period of years; if, indeed, she ever does recover.

All rational therapy should rest upon a basis of accurate diagnosis, and in this instance it is exceedingly important that this be done. Cleland states that in the last one hundred cases he has found carcinoma five times by microscopic examination of the scrapings from the uterus, in cases in which there was no clinical evidence to suggest the presence of such a condition. This figure seems high, but nevertheless a preliminary curettage should be done as a matter of precaution, unless there is some definite contra-indication to this procedure.

If it can be positively established that no latent infection is present in the pelvis, radium may then be inserted at the same operation, but if there is the slightest suspicion of infection in the pelvic organs (pus tubes past or present, old healed pelvic cellulitis, etc.) the use of radium is absolutely contra-indicated, and such a patient should be treated by carefully administered x-rays according to the modified voltage technique.

If radium is used in these cases it should be administered within the uterine cavity. The dose recommended is now fairly well standardized, and consists of a fifty milligram silver tube within a brass tube having a wall thickness of two millimeters, and this in turn enclosed in a pure gum rubber container also of two millimeters wall thickness. Such an applicator is left in situ for a period sufficient to deliver an average dose of fifteen hundred milligram hours, slight modifications being made in the individual case as may be deemed advisable.

The same result may be obtained by the use of x-rays, and in this case the whole procedure is rather more simple. As a rule the patient referred for x-ray treatment has already had a curettage, and this is, therefore, unnecessary before commencing treatment. The curettage having failed to control the bleeding, it is now desired to do so by means of x-ray exposure.

The administration differs only in detail from that outlined in the treatment of bleeding in young women. In the present instance it is our practice to administer two anterior and two posterior areas, concentrating the beam of rays upon the uterus and ovaries and administering an exposure as follows: Spark gap, 9 inches; miliamperes, 5; filters, 6 mm. aluminum, time 15 minutes; distance, 10 inches. This dose is given preferably immediately after a period of bleeding, one area being given each day until the four have been completed (two a day may be given if desired, or indeed the entire series at one sitting), and this is then repeated after the next succeeding period. A third may be necessary and is advisable if one wishes to make absolutely certain of obtaining the permanent cessation of the function.

In the presence of suspected infection this dose is too severe, and might be dangerous. Under these conditions recourse should be had to the method outlined in the first part of this paper. Such a dose has been used very successfully by us in a number of cases for the

control of acute and chronic salpingitis, and has never to my knowledge caused an acute exacerbation of pelvic infection. We believe it can be used safely and by repeating it more often the same end-result may be obtained.

In the same manner by using higher voltages and heavier doses, the whole result may be brought about at a single treatment in a manner comparable to the use of radium. We have preferred the first method described as against either radium or the intensive x-ray method, because it more nearly approximates the natural cessation of the menstrual function, taking place over a period of months rather than within a few days or weeks. It has seemed also that the undesirable features of the menopause have been less marked under these conditions.

Results.—We have records of the treatment of 148 such cases as outlined above using some one or other of the various methods mentioned. In no case of which we have knowledge has the treatment failed to control the hæmorrhage. There has been no mortality. The average number of treatments necessary have been two (series) with no hospital expense, no anæsthetic, and none of the other additional expenses incidental to operative procedures. It has been our object throughout to produce the desired result with the minimum of radiation, with the consequence that in a few cases in which only two series of treatments were given slight bleeding has returned later. This could, of course, be prevented by invariably giving an additional exposure (which, however, would be unnecessary to the vast majority and therefore undesirable). Such an occurrence is not in any sense a failure in the treatment.

PART III.—*Radiation treatment of Fibroid Tumours.*—(a) In young women.—Owing to the possibility of damage to the ovary with its contents, it is highly desirable that the radiation treatment of fibroid tumours during the child-bearing period be reduced to the minimum, and if undertaken at all, only by those with much experience in this field. In all cases in which simple myomectomy is possible, it is probable that this is the method of choice. But an occasional case will be presented in whom for some reason operation is not possible. Experience has amply shown that it is quite possible to shield off the ovaries, concentrate the x-ray beam upon the uterus only, and cause the complete disappearance of such tumours without harm to the ovary or any material interference with menstruation. Several cases are now on record in whom subsequent pregnancy has occurred with normal living children at full term.

(b).—Fibroids complicating pregnancy.—For many years the statement has been made and has found its way into a few text books that x-ray treatment of fibroid during pregnancy was wrong, and likely to be followed by disastrous consequences. While the number of cases of which we have personal experience is too small to make any general denial of such a statement, yet, we believe these will show that under properly controlled conditions such treatment may be carried out with entire safety and results of very great practical value. Three cases are reported.

Case 1.—Referred by Dr. Gordon Copeland, and reported fully by him elsewhere.

This patient was referred during the fourth month of pregnancy, having a cervical fibroid of some size undergoing progressive enlargement. It was so situated as to constitute a definite obstruction to labour, and from its pressure was causing pain. Two comparatively light exposures caused the prompt and complete disappearance of this tumour. In the treatment the uterus and other pelvic organs were carefully screened off, and only the cervical region with the fibroid treated. The patient went to full term, labour was uncomplicated and uneventful, but the child born proved to be a monstrosity (Siamese twins). It is agreed by all who have studied this case that x-ray treatment could have had no part in the causation of such a monstrosity. At the period at which the treatment was administered, the conformation of the fœtal body would be fully determined.

Following delivery normal menstruation was resumed in due time, and has continued since. There was, therefore, no damage to ovarian tissue by reason of the radiation.

Cases 2 and 3.—Referred by Dr. Van Wyck, and reported fully elsewhere by him.

In both of these patients, fibroids were known to be present prior to conception, in both they increased in size after conception, and in both the deciding factor in under-

taking treatment was pain. This pain was described as being so severe as to be almost unbearable, and was becoming progressively worse.

One patient presented a feature of unusual interest in that her sister had also suffered from a similar complication of pregnancy (by fibroids), and had died following an operation for their removal. The patient, therefore, was opposed to surgical intervention, and quite willing to try any method which seemed to offer a solution of her trouble.

Both patients were treated at about the same stage of pregnancy (four months) and in very much the same manner. The relief of pain was spectacular, and began within twenty-four hours following the administration of the treatment. Within three weeks the tumours were completely gone in both cases, and no further treatment was necessary. Both went to full term, and were delivered of perfectly healthy children.

The outstanding feature of all three of these cases has been the small amount of radiation required to secure complete recession of the tumours. The treatment was slightly modified in each in order to best adapt it to the particular location of the tumour, but the amount of actual radiation would correspond to a single area over the tumour consisting of a ten-minute exposure, all other factors remaining the same as already detailed earlier in this paper.

There is, therefore, no doubt that such treatment may be given quite safely, and that a small amount of radiation may be sufficient to produce a satisfactory result. Such being the case there is no need to administer very heavy or intensive doses by high voltage methods or by radium, and this is the type of radiation which might be expected to cause damage to the developing fœtus. We have accordingly reached the conclusion tentatively, that in all future cases we shall advise a preliminary radiation along the lines described above before undertaking any more radical procedure either surgical or by heavier doses of either x-rays or radium. It cannot be denied that the use of intensive treatment especially of the high voltage type might be attended by unfortunate or disastrous consequences. But the amount of available exact information on this subject is so small as to make it difficult to reach a satisfactory opinion.

Diressen (Leiden) has collected nearly twenty cases since 1914 in which women were exposed during pregnancy to the Roentgen rays, and reports that the fœtus was injured or destroyed in half the cases. This injury he states to be more probable in the earlier stage of the pregnancy, and affects the nervous and vascular systems and the special senses, especially the eye. He makes no statement in this article of the amount of radiation applied in any of the cases reported or for what purpose the treatment was administered, and concludes by stating that thus far no injury has resulted from the use of x-rays for the making of Roentgenograms, but thinks this may be a possible source of danger as well.

At the present time the x-ray is being used freely in this country as an aid in diagnosis during pregnancy, and if this use of the rays were attended by any undesirable consequence it would seem that this fact would be amply evident. As a matter of fact we have failed to find any authenticated case reported, and think the danger from this source must be negligible when compared to the importance of the information made available by its use.

(c) Uncomplicated fibroids.—Whether in a given case a fibroid should be treated (or removed by any other means) is outside the scope of this paper to discuss. No doubt many fibroids do not require treatment of any kind. But having decided that some method of dealing with the problem is advisable it is essential to establish certain facts as accurately as possible.

1.—That the tumour under consideration is actually a fibroid and not a cyst (which would be uninfluenced by radiation).

2.—That the fibroid is not pedunculated (or has not a narrow pedicle at least).

3.—That there is no infection in the pelvis.

4.—The size of the tumour and as far as possible its point of origin (subserous, intra-mural or submucous).

These are the factors of greatest importance, and from a knowledge of them the probable effect of treatment may, we believe, be fairly accurately predicted.

Infection of any sort in the pelvis is a funda-

mental contra-indication to the use of radium or intensive x-ray in any of these conditions. A pedunculated fibroid having a narrow pedicle must be treated, if at all, with the greatest care. A broad pedicle we have found to give no trouble whatever, and do not consider it a matter of importance. Submucous fibroids we believe are better treated surgically, but if this is not done radium is preferable to x-rays. Thus we return to the title of this section, viz., "Uncomplicated fibroids," which constitute the legitimate field for this form of therapy.

Results of treatment: Fibroids up to the size of a four months' pregnancy are treated equally well by either radium or x-ray, and in each the percentage of cures is almost 100 per cent. Some writers report from one to two per cent failures in nearly all of which some complicating factor was present. There is no doubt, however, that this treatment is successful in a very uniform manner. We have treated eighty-six such cases and in these there has been no case in which the tumour has not disappeared entirely.

In those cases in which the tumour extends half way up to the umbilicus, the field in which radium is of value gradually diminishes, and in these larger fibroids it is our strong conviction that x-rays are more effective. The possibility of a complete disappearance of the tumour is lessened and the length of time over which treatment will be necessary is correspondingly increased. In this group the percentage of successful results still remains sufficiently high to make the procedure a very efficient method. Even in those few cases in which the tumour does not disappear entirely it is reduced to such an extent that it can be recognized with difficulty, and usually gives no symptoms. Such a result may, we believe, properly be regarded as a cure.

Massive fibroids reaching well up to or beyond the umbilicus are of such a nature that it would be idle to expect their disappearance by such a method. And it is in a graded group of cases from the preceding, all the way up to the more extreme examples of the present group that the failures recorded against the radiation method of treatment largely lie. If a good record in the matter were the only consideration, it could be established by declining to treat these cases. But much may be accomplished even in these.

We invariably advise that surgical treatment of this type of case is the method of first choice, and if for any reason this is not desirable, or if the patient declines operation, then radiation may be expected to reduce the tumour, but not to cause its disappearance. The amount of reduction which may take place is surprising, and in many cases has been sufficient to render the patient comfortable.

Multiple Fibroids.—In our own experience the greatest number of failures has been in the group of large multiple fibroids, and in these we have seldom seen complete disappearance of the tumours. Since these are the cases in which malignant degeneration is most likely to take place, we place them in the same category as the very large massive fibroids and advise surgical removal. Unless there is some very strong reason against this being done we believe it should be insisted upon, and that such cases should only be treated by radiation in case operative interference is definitely contra-indicated.

Peculiar Discolouration of the Skin.—Fifteen cases of pigmentation of the face as the result of using cosmetic containing calomel have now been encountered by W. H. Goeckerman, Rochester, Minn. From one patient he was able to obtain permission for a biopsy. The section was removed from a discoloured portion on the posterior aspect of the neck. The pigment granules were found in all layers of the skin and in the subcutis; they constitute a true pigmentation. There seems to be no special predilection for any of the layers of the skin, or its special structures, such as the glands. The fact that the granules are seen in different degrees of density throughout the cutis and subcutis would seem to indicate that they are gradually absorbed into the system. Incidentally, this would help to corroborate the conception that mercury used by inunction is actually absorbed by the skin.—*Jour. Am. Med. Ass.*, February 14, 1925.

XUM

THE TREATMENT OF THE PERNICIOUS VOMITING OF PREGNANCY

H. B. Atlee, M.D., C.M., F.R.C.S. Ed.

Head of Dept. of Obstetrics and Gynaecology, Dalhousie University, Halifax, N. S.

UUTIL lately the so-called pernicious vomiting of pregnancy was looked upon as entirely the result of a toxæmia; but in view of the success which has attended attempts to cure the condition by suggestion, that theory has undergone modification. Some authorities state quite bluntly that all but a small percentage of cases of pernicious vomiting is purely neurotic in origin; others, while agreeing that there may be a neurotic element present, still believe in an underlying toxæmia to which the neurosis has added itself. The more I see of the condition the more I incline to the view of the former school.

Of course there are cases of persistent vomiting associated with a definite toxæmia; cases with a high temperature, bile-stained vomit, bile and albumin in the urine, jaundice and a high pulse-rate; but these cases are very rare. Practically all the cases I have seen have appeared to me to come under the neurosis type, and their response to treatment seemed further to prove that. Indeed, in the most marked cases of toxæmia of pregnancy that have come under my care vomiting was not the most outstanding feature, but a decidedly secondary one.

We have probably leaned too long on the toxæmic theory because we did not understand our biochemistry. We have been taught that when the ammonia coefficient went above 10 a toxæmia was present, and that if it began to rise higher an abortion should be done. But a high ammonia coefficient is only a physiological reaction occurring to offset a condition in which the carbo-hydrates are not being sufficiently oxidized. Acetone in the urine was another stumbling block; but acetone in the urine is due to the incomplete oxidization of fats, which in turn is due to the starvation the vomiting patient is undergoing. It is therefore the vomiting that causes these conditions and not they the vomiting.

But perhaps the greatest evidence of the neurotic origin of the vomiting—apart from the purely suggestive treatment—is the success that has attended a whole host of so-called cures. Horse serum, serum from the patient's blood, extracts of the ductless glands, intravenous sodium bicarbonate and glucose have been used by various men with gratifying success. In a recent number of the *Journal of Surgery, Obstetrics and Gynecology,* an account of the treatment of five cases of pernicious vomiting that correspond closely to the four cases I will quote, were treated with insulin—which like all new remedies is being tried for everything—and cured. And yet my cases got no insulin or any other treatment but suggestion, and they were cured!

I have been using the suggestive method of treatment for all cases of vomiting of pregnancy, including the pernicious type, both in hospital and private practice, for the last four years and have found it most satisfactory. Nor have I experienced a failure yet, though I say this in all humility, realizing that no cure is infallible.

What is this suggestive treatment? In my practice it is a very simple matter, necessitating merely a certain elementary knowledge of psychology and some moral courage. First of all I get the patient, public or private, into hospital, if I can; for these cases do not respond as satisfactorily when treated at home. One can usually assure the patient that she will only need to stay in hospital a week. If I can't get her into hospital I get her into a room by herself and exclude from this room all old women. If a patient can afford a nurse so much the better; and the nurse must be impressed with the efficacy of the treatment.

Having got the patient into hospital—or its best substitute—the vomit bowl is kept away from her. If she wants to vomit she is told to vomit into the bed and when she does vomit the nurse is instructed not to be in too great a hurry to change her. If she is greatly dehy-

drated she is given rectal injections of 5 per cent glucose solution, either in quantity or by the Murphy drip. If she has any idea that an abortion—which she may desire—is to be done she is firmly disabused of that idea. She is told that under no circumstances will an abortion be done. If, on the contrary, she does not want to lose her baby the other tack is taken.

I do not make a practice of explaining things to the patient herself, but instead give my orders to the nurse in the patient's hearing; and I find that a certain curtness of manner works to advantage. Ordinary food is brought to the patient by the nurse at the regular meal hours and put before her as though we were quite convinced that the patient could keep such food down. She is never asked if she thinks she can keep some nourishment down; the nourishment is placed before her; she is told to eat it and assured that she will keep it down. It is better to give solids than liquids. No visitors are allowed near the patient; no fuss is made over her; and the nurse is instructed to leave her to herself as much as possible.

With the above treatment I have not yet failed to cure a case of pernicious vomiting that did not definitely fall into the toxæmic class.

I quote four of my cases herewith, in support of the above assertions:

Case 1.—Primipara of twenty-five, three months pregnant, vomiting almost continuously. Urine shows acetone plus-plus. No temperature. Pulse rate 100. This patient had been treated by restricting and modifying diet, drugs, etc., without any relief. I tried her with suggestion. She was a newly-wed private patient and was lying on a chesterfield in her drawing room when I visited her. Alongside the chesterfield was a particularly fine rug—a wedding gift. I told her when she felt sick not to vomit into the bowl she had by her but on to the carpet and assured her that on attempting to do so she would find she couldn't vomit. She was better even for such suggestion and did not vomit that afternoon. That night she ate a fairly hearty meal, the first in ten days. Feeling sick immediately afterwards she remembered my orders and turned to the new carpet. She vomited the whole meal over the beautiful carpet! But that was the last time she vomited throughout her pregnancy. Her acetone cleared up at once and her pulse rate dropped to 75.

Case 2.—Aged twenty-six; second pregnancy. Her first pregnancy the year before had been interrupted because of pernicious vomiting. When she came into hospital she was dehydrated, sunken-eyed, retching and vomiting continuously, and when I went to examine her she called loudly to the nurse, who had gone to empty it, to return with the kidney basin. On examination her urine showed acetone plus-plus-plus; and a slight trace of albumin. Her pulse rate was 120, and the outside doctor said it had been so for two days. Here was a case in which the slight trace of albumin pointed to a toxæmic cause; but I decided before considering the therapeutic abortion for which she had been sent in, to try suggestion. In her presence I ordered the nurse to take away her vomit basin and let her vomit into the bed. I then assured the patient that under no consideration would I do the therapeutic abortion for which she had been sent in and for which she seemed too eager. When I saw her the next morning the vomiting had ceased. She had vomited twice into the bed after I left her the day before, but from then on did not vomit again, and on the second day following both acetone and albumin were gone from her urine and she was eating ordinary ward diet, minus meat. She left the hospital at the end of the week feeling perfectly fit, without any nausea, and with a good appetite.

Case 3.—Aged thirty; second pregnancy. Vomited persistently through first pregnancy which terminated spontaneously at seven months. Said she was fed entirely throughout the last month of that pregnancy by rectal tube. On admission patient had missed but one period due three weeks before. A week after the period failed to come on she began to vomit and had done so ever since, keeping nothing down. Greatly dehydrated. Acetone plus-plus in urine. On admission patient was vomiting and retching and when I first visited her was clutching fervidly her vomit bowl. I ordered the nurse to take the bowl away and let the patient vomit in the bed. Patient was put in a separate room and no one allowed to see her but her nurse. She vomited once thereafter and took ordinary diet the day following. She was another week in hospital during which she did not vomit or feel nausea, and she went out with a good appetite.

Case 4.—Aged twenty-one; married three months. In spite of old striæ gravidarum and a somewhat relaxed vaginal inlet this patient vigorously denied a previous pregnancy. She had had three months' amenorrhœa. The vomiting came on two weeks after marriage and grew rapidly worse until she could keep nothing on her stomach. She was in bed for three weeks before admission and had had severe headache for past month. The uterus was about the size of a three months pregnancy. Urine contained albumin plus-plus-plus, and acetone plus-plus-plus, as well as some hyaline casts. The patient was sent into hospital by an outside doctor to have a therapeutic abortion done. I was sent to see her late the evening of her admission. She was retching continuously, greatly dehydrated, pulse 120, temperature 100. Not knowing then that she had so much albumin in her urine I instituted the usual treatment for a neurotic case. She was put into a separate room, denied the solace of a vomit bowl, and firmly assured that under no consideration would the abortion for which she had been sent in be done. To this treatment, because of her greatly dehydrated condition, I added continuous rectal glucose 5 per cent solution. When I arrived at hospital next morning my house surgeon informed me of the urine analysis. It seemed to me, however, that the patient was somewhat better under treatment. She had vomited three times during the night into her bed, but had not vomited now for five hours. I ordered the treatment continued. She vomited three or four times that day and slept all night. The next morning she looked decidedly better and there was less albumin and acetone in her urine. That day she vomited only once and slept the next night through. Much better the next day; did not vomit again. The following day—the fifth from admission—she looked better, there was neither albumin or acetone in her urine, and no casts. She was in hospital another week, did not vomit again, in spite of being put on a full diet—less meat. She left hospital feeling quite well, with a good appetite, no nausea, and looked a different woman.

THE PHYSICIAN IN HIS RELATIONSHIP TO INDUSTRIAL TOXICATION*

PROF. V. E. HENDERSON

University of Toronto

Chairman, Committee on Industrial Medicine, Ontario Medical Association

IT has fallen to my lot this morning, to lay before this conference a viewpoint which is perhaps not sufficiently realized by the profession at large and which makes the work of this committee particularly difficult. The Committee on Industrial Medicine deals with two problems arising from the relationship between employee, employer, and attendant physician. The first problem is that of the prevention of disease in industry. This will be particularly dealt with by some of the other papers. The second problem is that of the recognition and treatment, and where possible, prevention of industrial toxications. This problem is a particularly new one, and has not as yet been adequately recognized in this country, but nevertheless we can safely say that we are not lagging greatly behind the rest of the world in this respect. In only one country is the problem clearly realized and this is in Great Britain where owing to a long experience of industrial conditions great progress in its solution has been attained. In Germany too, many steps have been taken and much information accumulated which is of great value.

Let me present one aspect of the matter with two illustrations. In a small town in Ontario there is a confectionery and biscuit manufactory. Some years ago, when my interest in this matter was just being aroused, I was visiting one of the physicians in this town who had as patients a great many of the employees of this plant. I asked him whether he found amongst the employees a number of industrial toxications. His answer was, "No, I don't think such things occur." I then asked him whether he saw any cases of dermatitis. Did he not find that amongst the bakers, cases of so-called baker's itch or psoraisis occurred on the hands. This he answered in the negative, but when I asked about those coming into contact with sugar he said, "Oh yes, we found that they were very liable to have an eczema." I pointed out at once that this was what I would call an industrial toxication, that it was no doubt due to the hands of the workers being splashed with hot saturated solutions, and that in process of time certain of the workers were likely to become extremely susceptible to it, and that in many cases it would be found hard to cure. He at once stated that he had encountered such cases and found that only a change of employment provided adequate relief.

In another town where there is a furniture factory, I asked similar questions with very similar results. The physician had come across a case of dermatitis in the case of an employee who was engaged in polishing hardwood, possibly due to boxwood or rosewood, and also of inflammation on the hands and arms, which he thought was possibly due to the turpentine with which the workmen came in contact. But he had not classified them in his mind as industrial toxications.

This, I think, is one of the great difficulties that at present prevails, and it may be illustrated by the results obtained in Boston when at the Massachusetts General Hospital an industrial clinic was formed.

It had for years been the custom to set forth in some detail on the card prepared for each out-patient the character of his occupation and from these some estimate could be formed of the hazards of his industrial employment. A careful examination of the cards indicated a much larger number of industrial intoxications than were suspected and in consequence an elaborate clinic was established, with the result that every male and certain females coming to the clinic were subjected to questioning as to whether he was exposed to any industrial haz-

*Read at the Conference on Industrial Medicine, Ontario Medical Association, at the Academy of Medicine, Toronto, January 14, 1925.

ard. The result was astonishing. For example. in the previous five years there were 146 cases of lead poisoning noted in the records of the hospital, while in the first year of the clinic they encountered 150 cases. Many of these were of course at the moment not severe, and indeed not the subject of complaint by the patients, yet these persons were all affected to the extent that, were the exposure continued, they would have shown symptoms. They found in the clinic that of about 32,000 cases coming to the hospital for all purposes, about 5,000 showed some disease due to the industry in which they were employed, and that about 40 per cent of these cases were more or less serious. They found, further, that their exact study of the industrial hazards was frequently important in throwing light in many instances on the diagnosis, and that many cases would have been diagnosed quite incorrectly in the ordinary course of events without this knowledge. These studies have led the physicians of Boston to be more on the lookout for the effects of industry on the workman.

Of course the conditions in Boston may by no means be typical of those prevailing in Ontario, yet many similar industries are found here, and we have encountered in this province, owing to the industries that we have, a considerable list of poisons which do not figure at all in their reports. As Dr. Riddell has shown, there have been a considerable number of toxications with benzol, but owing to the work of Dr. Boyd, of Simcoe, we have complete clinical histories going on to death, and we are gradually acquiring a knowledge of the early symptoms of chronic toxication by it, so that we are justified at present in setting up the following provisional criteria on which a diagnosis might be based:

(1) Constant and long continued exposure to low percentages of benzol, and when I tell you that 0.016 cc. in a thousand, or one part in about 100,000 in air, will produce acute poisoning, you will see that the amount does not need to be large and often is not more than probably two parts in a million.

(2) A feeling of lassitude, weakness, often with lack of appetite, and sometimes attacks of dizziness and fainting.

(3) A white blood count of under 5,000.

Similar progress has been made in the diagnosis of nickel rash where, owing to Dr. Mackenzie of Port Dalhousie, we have a very distinct picture.

Any furniture-making establishments will be exceptionally fortunate if it does not have dermatitis arising among some of its workmen. The same is true of candy and biscuit manufactories, and tanneries. Plants manufacturing rubber, tin cans, picture frames, furriers and any occupation involving grinding with sandstones, and also any other manufactory in which there are large amounts of dust, will very probably show instances of toxication.

I doubt not that in every small town and in every industry employing a considerable number of workmen similar toxications are seen, but as they are usually not recognized as definitely due to the action of irritant materials, and as frequently the employee changes his occupation and is lost sight of, they are as a rule undiagnosed.

This committee is striving to get definite clinical pictures of all such cases, because it is only by their accumulation and careful analysis that definite diagnostic criteria can be formed, and that we may have any hope of obtaining compensation for temporary disabilities or death arising therefrom. And further, to enable us to act as a source of information for employers or physicians who are attempting to improve the conditions under which employees work and thus decrease the hazards of toxication.

The Department of Industrial Medicine of the Board of Health of this province is endeavouring to make a survey and compile such information, yet it is handicapped owing to the fact that the health of workmen really comes under the survey of three departments of the government:

(1) That of the Department of Labour which administers the Factory Inspectors Act.

(2) The Workmen's Compensation Board, under the Attorney-General's Department.

(3) The Department of Industrial Medicine of the Board of Health.

In England great progress has been made because the factory inspectors are controlled and advised by fully qualified and specially trained medical men who are keen in recognizing the hazards of industrial toxication, in diagnos-

ing its cause and in suggesting means for its alleviation or prevention, and who can supply much valuable information as a guide in compensation cases. A great step forward would be taken were there a definite liason between the factory inspectors and the Department of Industrial Medicine.

Finally, let me call the attention of the profession and especially of those who are closely in contact with industrial workers to the fact that a physician can often save the employer much loss in labour turnover and in the character of workmen's performance, if he makes himself thoroughly familiar with the conditions under which the workmen are employed, and if he makes a determined effort to assist the employer in this way.

While I feel that the Workmen's Compensation Act has been of great value to the employee and has enabled him to be compensated for his injuries, I think the papers given here this morning will show clearly that it has its disadvantages from the standpoint of the employee's health and well-being, and I further feel that too frequently the physician attached to an industry has not fully realized the possibilities of his position. I have known two or three cases where a physician has been employed by an industry receiving a compensation of $1,000 or $2,000 per annum, that he has at once insisted on a nurse who would look after minor injuries and their treatment and be continually at hand. No doubt this has been of much benefit to the employer and employee, but if one puts the nurse's salary at $1,800 per annum one finds the total salaries are not far from $3,000, and often more. I am quite sure that a young man on a salary of $3,000 who devoted his whole time to the work would very soon be able to demonstrate that he could save his employer a great deal more than the combination of part time doctor and nurse, and that he would become intimately acquainted with the works and the conditions therein and prevent much illness. That he would, in other words, have made a place for the physician at a salary which would grow and save one of our graduates from migrating to the United States in order to earn a living. The mistake that is made is the employment of a nurse; she quickly becomes the physician so far as minor injuries are concerned; the value of the doctor becomes less noticeable as she becomes better trained, and if the employer wishes to save money the doctor goes. The doctor's field is much greater than the nurse's can be; he is able intelligently to appreciate the hazards of the industry, the efficiency of safety appliances, he can learn to test the efficiency of exhaust systems, and take many steps to prevent disease. This work the nurse can never do. In preventing disease and dealing with minor diseases, he is particularly aiding the employee because it must be remembered that it is the minor and to a large extent preventable ailments which cause the greatest loss to the employee. In most of our large industries the average loss of time per employee, per year, is eight days for minor injuries and ailments, even in well controlled establishments. In many industries it is much more than this. A physician efficiently superintending an industry can easily reduce this to two days. This loss of time is uncompensated. It is a clear loss to the worker. Such a reduction in lost time would be a great gain to the employee, and in busy seasons a great gain to the employer also.

Value of Co-operation between Internist and Surgeon.—In complicated gastric conditions Donald C. Balfour, Rochester, Minn., says he performed partial gastrectomy on seventy-four patients with one death. The seventy-four cases in the series were: gastric cancers, thirty-three; gastric ulcers, twenty-five, recurring gastric ulcer, one; gastrojejunal ulcers, nine; duodenal ulcers, four; jejunal ulcer, one, and malfunctioning gastroestenostomy, one. The majority of these patients had received preoperative rest and treatment as outlined, and the convalescence has also been followed, when indicated, by the members of the gastro-enterologic staff. A brief review of the technic of partial gastrectomy is made. In this series of cases, ethylene anæsthesia, combined when necessary with sufficient ether to secure satisfactory relaxation, was used in sixty cases; a combination of local and ether anæsthesia in three cases, and ether anæsthesia alone in only one case.—*Jour. Am. Med. Ass.*, March 21, 1925.

THE PRESERVATION OF BLOOD SAMPLES FOR CHEMICAL ANALYSIS*

A. T. CAMERON, F.I.C. with the assistance of JESSIE E. WILLIAMSON

From the Department of Biochemistry, Faculty of Medicine, University of Manitoba

ONE of the duties of the staff of a department of biochemistry in a faculty of medicine is, in my opinion, to test recently published analytical procedures that appear useful and easily utilizable for clinical purposes, and if the results are satisfactory, to bring these methods to the notice of clinicians.

A difficulty frequently arising in connection with chemical analyses of blood has been the non-existence of a suitable method of preservation. Blood samples for analysis of sugar, creatinine, non-protein nitrogen, and uric acid, are usually drawn into a little ammonium oxalate to prevent clotting and then the analyses carried out as soon as possible. But blood samples are occasionally taken late in the afternoon, or during evening or night, when laboratory technicians are not immediately available. Such samples can at best only be kept (with oxalate) in an ice-box till next day, and then the results are open to some suspicion, since during such standing blood-sugar especially is likely to have decomposed in part, and too low results may be obtained. Further with the wide-spread use of insulin by patients throughout the country it seems very desirable that doctors and district nurses visiting patients who have been standardized for insulin and are administering it to themselves, should be able to use a preservative which would enable a sample of blood to be kept for a day or two and yet give reliable results. With the methods at present in use, such a sample examined after twenty-four hours would, if the blood sugar were really high, tend to show a normal value indicating that the insulin dosage and diet were still correct, or if the blood sugar were really normal, tend to show a dangerously low figure leading to the erroneous conclusion that the insulin dose was too high.

In 1920 Denis and Aldrich suggested that formaldehyde could be used as a preservative for blood samples, and quoted data to show that when it is used blood sugar remains constant for at least four days. Bock, in February, 1924, showed that the average sample of commercial formaldehyde will itself reduce alkaline copper solutions, so that by its use with blood too high values are obtained for blood sugar.

In November, 1923, Sander published a method for preserving blood which appears to give satisfactory results. Blood is drawn into a test-tube containing a mixture of sodium fluoride and thymol. The proportions of these reagents required are *at least* 0.01 gram of sodium fluoride and 0.001 gram of thymol for each cubic centimetre of blood drawn. Excess of the preservative hæmolyses the blood, but does not affect the chemical analyses.

Under usual conditions not more than 10 cc. of blood will be required (if sugar determinations only are to be made, 2 or 3 cc. will suffice), so that the amount of preservative will be eleven-hundredths of one gram of a mixture containing ten parts by weight of sodium fluoride and one part of thymol, somewhat less than will go on a ten-cent piece. This is placed in a dry, clean test-tube, and blood, taken from the patient in the usual fashion, is transferred as rapidly as possible to the tube with continuous shaking. No clotting takes place. No specially sterile conditions are required, except with regard to the patient.

The bright red colour of the freshly drawn blood is maintained for several days. Sander claims that the values of non-protein nitrogen, urea, uric acid, creatinine, creatine, and blood-sugar, have the same clinical significance if determined after five or six days, as if determined immediately after the blood is drawn, and, with the exception of non-protein nitrogen, the figures remain constant for two weeks. Non-protein nitrogen shows a slight increase.

*Read at a clinical meeting in the Winnipeg General Hospital on December 4th, 1924.

In 1924 Denis and Beven stated that sodium fluoride is efficient (60 mg. per 10 cc. blood) for determination of blood sugar, urea, non-protein nitrogen, creatinine, and uric acid within forty-eight hours, and, with the exception of non-protein nitrogen, for ninety-six hours. They do not refer to Sander's paper.

TABLE I

NORMAL MIXED HUMAN BLOODS

Sample No.	*Time days*	*Glucose*	*Creatinine*	*Urea-N*	*Non-protein-N*	*Uric acid*
1	0	0.08	1.3	15.2	37	...
	7	0.08	1.3	13.3	35	...
	10	0.07	1.3	17.5	32	...
2	0	0.09	1.4	16.9	42	3.2
	3	0.09	1.4	15.6	43	2.7
	7	0.07	1.4	16.7	45	2.5
3	0	0.07	1.4	13.6	33	3.4
	3	0.07	1.4	15.4	39	2.6
	6	....	1.6	14.7	33	2.7

TABLE II

PATHOLOGICAL HUMAN BLOODS

Case No.	*Condition*	*Time days*	*Glucose*	*Creatinine*	*Urea-N*
1	Perforated œsophagus	0	0.52	...	....
		2	0.50	...	....
		2	0.50	...	....
		4	0.50	...	....
2	Diabetes mellitus	0	0.33	....	....
		4	0.30	...	....
		7	0.28	...	....
3	Nephritis	0	....	1.6	22.7
		2	....	...	22.0
		4	....	1.6	22.4
4	Nephritis (October 22)	0	....	3.4	37.7
		5	....	3.4	40.7
	(November 22)	0	....	6.9	69.2
		3	....	6.5	68.1

We have tested Sander's method, using no elaborate precautions, but proceeding as would the average technician or nurse called on to use such a procedure for taking samples. Our results show that at any rate for three or four days the values of blood-sugar, creatinine, urea, and non-protein nitrogen remain unaltered. Uric acid seems to show a rapid decrease, and this is the only difference between our results and those of Sander. Our figures are shown in Tables I and II. The time is that which has elapsed between collection and analysis. Amounts are expressed in milligrams per 100 cc. blood.

A few tests with cholesterol indicated that this can also be accurately determined with this preservative. During the tests the bloods examined retained their bright red colour for at least five or six days.

Our figures, considered with those of Sander, permit the conclusion that his preserving method can be used satisfactorily to obtain results for blood, accurate for clinical purposes, when the analyses for glucose, urea, and creatinine are carried out within four days after the sample has been drawn, so that it seems ideally suitable for the conditions mentioned at the beginning of this paper.

Similar tests with dog's blood were not so satisfactory, and we have not yet ascertained the cause. The blood darkens sooner, and the sugar appears to begin to decompose at a time corresponding to this darkening. Excess of the preservative gives no better results.

We have used the ordinary analytical procedures. Blood proteins were precipitated with tungstate; glucose, creatinine, and non-protein nitrogen were determined by the usual Folin-Wu methods given in Hawk (7th edition) and uric acid by Folin's 1922 method using the reagent described by him in 1924. Cholesterol was determined by Bloor's method (quoted by Hawk) and urea by the urease method.

REFERENCES

BOCK, J. C., *Journ. Biol. Chem.*, 1924, lix, 73. DENIS, W., AND ALDRICH, M., *ibid.*, 1920, xliv, 203. DENIS, W., AND BEVEN, J. L., *Journ. Lab. Clin. Med.*, 1924, ix, 674. FOLIN, O., *Journ. Biol. Chem.*, 1922, liv, 153. FOLIN, O., AND TRIMBLE, H., *ibid.*, 1924, lx, 473. HAWK, P. B., *Practical Physiological Chemistry*, 7th edit., 1921. SANDER, F. V., *Journ. Biol. Chem.*, 1923, lviii, 1.

DIABETES INSIPIDUS*

EDWARD S. MILLS, M.D.

Montreal

THE following case of diabetes insipidus is of interest because it occurred in the course of chronic ulcerative pulmonary tuberculosis and responded promptly and completely to the administration of pituitrin. It is the second case to occur in the last 70,000 admissions to this hospital. The first case has already been reported.

Mrs. G. P. S., age forty-three, white, housewife, was referred to the service of Dr. C. P. Howard because of intense thirst, urinary frequency, and dry, thick tongue.

Family History.—Mother died of cancer of uterus at forty-six. Otherwise negative.

Personal History.—Born in the Province of Quebec and has always lived there. Had been a telephone exchange supervisor until her marriage at the age of twenty-four, after which she had four healthy children with one miscarriage. Sexual development was in every way normal. She had fibrinous pleurisy at the age of twenty-one, but remained in fairly good health until the age of thirty-four when the signs and symptoms of pulmonary tuberculosis manifested themselves. During the past nine years the disease has been active and progressive. She has had persistent cough with expectoration, fever, and from time to time pulmonary hæmorrhages.

History of Present Illness.—There never had been any excessive thirst prior to October, 1924. During this month she suddenly developed an intense craving for water. The mouth became dry and "musty" and the tongue felt thick. She began to drink large amounts of water which tasted unusually refreshing. This polydypsia was followed in two or three days by urinary frequency and the passage of large amounts of pale watery urine. She began to drink gallons of water per day and to void every fifteen to twenty minutes by day and night. Solid foods became distasteful so that she would take only milk, eggnogs, and other fluid foods. This condition persisted until November 27th, 1924, when she was admitted to this hospital. During this time her weight fell from 110 to ninety-three pounds. There was no menstrual disturbance.

Physical Examination.—A small, well-developed but under-nourished alert white female of forty-three years. The cheeks were flushed and the eyes bright. The left pupil was slightly larger than the right but both were circular and reacted to light. The tongue was coated and the salivary juices scanty and viscid. Nose, throat, and ears were negative. The body was well formed, hands and feet small, and secondary sexual characteristics all present. Thyroid was barely palpable, not vascular. No retrosternal dulness. Skin had a normal texture. No temperature.

Lungs.—There was an advanced tuberculous process involving the right upper, middle, and left upper lobes with a large vomica in the left midscapular region. Heart extended from third rib above to the midsternal line on the right and 10 cms. on the left. Sounds were clear and regular. No murmurs. Blood pressure 124 - 68 right arm. Cranial nerves were negative. Knee kicks and ankle jerks were present. Plantar reflex-flexion. No Kernig. Pallæsthesia shins 80 per cent. No sensory or motor disturbances.

Laboratory Data.—The urine was pale and the specific gravity varied from 1,003 to 1,005 before the administration of pituitrin, from 1,008 to 1,014 after its administration. There was never any sugar or blood. Microscopically there were a few pus cells and various crystalline sediments. On two occasions a faint trace of albumin and a few granular and hyaline casts were found.

Blood Count.—Red blood corpuscle 4,690,000. Hæmoglobin 62 per cent (Dare).

Sputum on every occasion contained elastic tissue and acid fast bacilli. Wassermann was negative. Basal metabolic rate plus 15 (fever). Blood urea nitrogen 16 mgs. per 100 cc. Blood

*From the Medical Service of Dr. C. P. Howard, Montreal General Hospital.

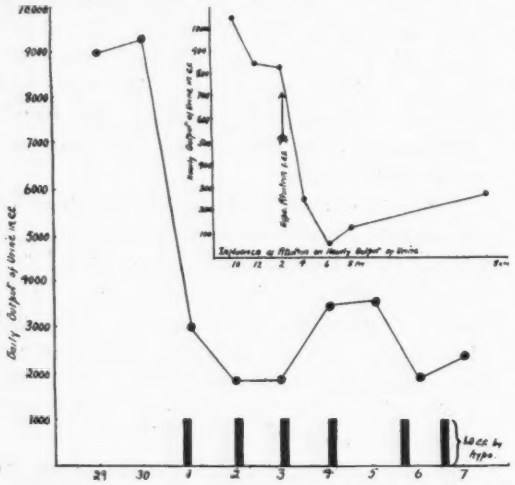
sugar 0.065 per cent. X-ray of chest confirmed physical examination. X-ray of skull showed that the sella turcica was slightly smaller than normal and the clinoid processes approximated.

Csépai Conjunctival Test.—Normally 1 drop of pituitrin (1 - 1000) will cause blanching for three to six minutes. No blanching occurred.

RESPONSE TO CSÉPAI SUBCUTAENOUS TEST
(1 cc. pituitrin 1-1000 subcut.)

	Blood Pressure	*Pulse*
Before administration	120 - 75	23 to quarter
5 minutes later	115 - 70	24 "
10 " "	115 - 70	25 "
15 " "	111 - 68	25 "
20 " "	109 - 68	26 "
25 " "	110 - 68	25 "
30 " "	110 - 66	25 "
35 " "	110 - 66	25 "
40 " "	110 - 66	24 "
45 " "	108 - 68	25 "
50 " "	110 - 66	24 "
55 " "	110 - 65	24 "
1 hour later	110 - 65	23 "

Normally both the blood pressure and pulse should rise. In Howard's fifteen controls the rise in systolic pressure varied from 5 to 38 mms. when only 0.5 cc. of the pituitrin was used. In this case there was if anything a negative reaction, both the systolic and diastolic pressures showing a minus ten variation. The effect of this test upon the urine is shown in the hourly output chart.



Influence of pituitrin on hourly and daily output of urine.

Clinical Course.—The temperature was of the intermittent type, ranging daily from 98° to 103°; the pulse from 82 to 104. After the daily administration of pituitrin the subjective symptoms disappeared as promptly as the polyuria. There was no longer a craving for water. When she did drink it tasted flat, having lost its refreshing character, and she began to take solid foods with relish.

She was discharged on December 7th with instructions to take pituitrin tablets gr. vii (fresh gland B.W.) three times a day. One month after discharge she was reported to be entirely free from symptoms but was taking the tablets as prescribed. There was no improvement in the pulmonary condition.

Discussion

The incidence of the disease at this hospital is lower than that at the Mayo Clinic where the statistics revealed twenty-four cases among 257,500 patients.

The diagnosis was readily established. The thirst, the polyuria, the character and quantity of the urine passed were at once suggestive. The positive Csépai conjunctival and subcutaneous tests, and the prompt and continued response to the administration of pituitrin confirmed it. No special stress could be laid upon the x-ray finding. The etiology of this case must as yet remain in doubt. The consensus of opinion now seems to be that diabetes insipidus is never really idiopathic but is always the result of organic lesions of the pituitary whether they be manifest clinically or not. To quote Rowntree: "Because of diagnostic limitations, the writer believes that, in the existence of a general disease capable of causing lesions which may set up diabetes insipidus, the diagnosis of primary diabetes insipidus is unjustifiable." In this case there is unquestionably generalized tuberculosis even though its clinical manifestations are almost entirely local, which is capable of, and has been found to produce diabetes insipidus. In the absence of other etiological factors, in so far as these can be excluded by both physical and laboratory examination, tuberculosis must be regarded as the causative agent. The proof of this can only be forthcoming at necropsy.

The case is of interest from the view point of treatment. It was surprising how readily the symptoms and output of urine responded to small daily hypodermic doses of pituitrin. Little hope of success in the administration of the drug

by mouth was entertained. One recent authority states that the administration of commercial extracts by mouth has proved unsuccessful to date. In view, however, of the difficulties of administering the drug hypodermically the oral method was tried and it was surprising to find it effectual even for one month.

REFERENCES:

(1) HOWARD, C. P., *Am. Jour. Med. Sc.*, No. VI, clviii, 830. (2) ROWNTREE, L. G., Nelsons Loose Leaf Living Medicine, iii, chapter vi, 179.

MEDICAL EXAMINATION OF SCHOOL CHILDREN

R. G. FERGUSON, M.D.

Medical Superintendent, Fort Qu'Appelle Sanatorium

PERIODICAL examination of school children is the most recent advance in the application of preventive medicine. Slowly, the prevention of disease has advanced through various stages; cleanliness, quarantine and isolation in the past; more recently smallpox vaccination, without knowledge of germ life; preventive inoculation and hygiene, based on the knowledge of germ infection, and, lastly, periodical examination for preventive purposes of apparently well people.

Cleanliness.—Preventive medicine itself is by no means of modern origin. Egyptian records going back several thousand years show that community cleanliness was enforced. Cleanliness of persons, dwellings and cities was regulated by law, and the priests of that time set a splendid example, in their frequent ablutions, the shaving of the entire body, and the spotless cleanliness of their clothes. The next stage in disease prevention was reached when the relationship between contact and the spread of disease was observed, and the practice of isolation of the sick was slowly evolved.

The principle of isolation is at least as old as the Bible story, in which records are found of leper houses being placed outside the gates of cities; the results secured by this isolation in the case of leprosy were notable. The same principle is being applied today, and more effectively in the prevention of bovine tuberculosis, by the elimination of diseased cattle.

The next great advance came when it was discovered that one can sometimes fight disease with disease. The observation of Jenner more than a century ago, when he noted that a milkmaid who had cowpox on her hand did not contract smallpox, followed by his ingenious experiment of vaccinating a lad with cowpox from her hand, and exposing him to smallpox, established the efficacy of vaccination, though the processes underlying this protection were shrouded in mystery. The control of the smallpox plague which followed the discovery at the time seemed almost miraculous, and was the forerunner of a greater and fuller knowledge of protection.

The greatest advance in all time, in preventive medicine, arose from the study of fermentation in wine which was shown to be due to bacteria and the question arose, if fermentation was due to bacterial growth, why not also putrefaction, and perhaps all disease.

The discovery of the germ cause of disease by Louis Pasteur more than fifty years ago, and the success of the preventive inoculation against anthrax slowly unravelled the mystery of infection and prophylaxis, and made possible the advance of hygiene, and modern sanitary science. As the causal germs of contagious disease have been discovered and understood, one by one diseases have been conquered by preventive treatment. Diphtheria has been robbed of its terrors within living memory, and typhoid practically banished.

The facts concerning germ infection, discovered by Pasteur, were afterwards applied by Lister in the prevention of wound infection and later, the same principle of germ infection was applied to prevent the spread of so-called "hospital diseases" such as gangrene and erysipelas.

A later and more modern development is the science of hygienic habits based on our knowledge of the germ cause of disease, which is being taught in our schools to-day. The danger of contact with sick persons; the danger of eating contaminated food; precautions as to what goes into the mouth, food, finger, or what not, and what comes out, cough, expectoration, or sneeze, all these common every day channels for the dissemination of disease are now popular knowledge. Though "fool-proof" protection can be bestowed by vaccine and inoculation against many serious diseases prevalent in this zone, yet, for protection against other diseases such as tuberculosis, we must depend upon intelligent application of sanitary measures, and careful personal habits. This class of protection cannot be given—it must be learned.

Apart from contagious and epidemic diseases which are now controlled by the application of health regulations, and preventive inoculations, there are other sources through which the blood may be poisoned; focal infections from which pus cells laden with bacteria may enter the blood stream and poison the system which, though they do not kill swiftly, undermine health and predispose to more serious and hopeless maladies. The hope of detecting such conditions, and the consequent prevention of the diseases which follow in their train, lies, first and foremost, in the full and systematic application of preventive medicine.

Recently, for preventive purposes, a complete examination of 500 school children was made at Weyburn. The children were examined from head to foot, teeth, tonsils, bones, abdomen, kidney, heart and lungs. Growth, nourishment and energy were noted, and a short statement of present health and complaints, if any, were taken down. A history of any preventive treatment, such as vaccination was also noted. While the results of this examination showed that there was little reportable illness in the community, and the children were, on the whole, an apparently healthy lot, neverthless a considerable number of them gave a history of being kept from school for periods during the past year, through ill health. Many were reported by the school nurse as always being tired, others were reported as being simply backward in school, and lacking in energy. In many cases the physical examination revealed ample cause for these complaints; as will be seen from the following table of ailments: Defective vision, 22.8 per cent; impaired hearing, 2.2 per cent; undernourishment, 7.4 per cent; decayed permanent teeth, 62.6 per cent; abscess of gums, 17 per cent; diseased tonsils, 30.8 per cent; nasal infection, 4.8 per cent; other nasal defects, 10 per cent; orthopædic defects 1.2 per cent; kidney conditions requiring attention, 8 per cent; heart conditions requiring treatment, .2 per cent; heart conditions requiring observation, 3.2 per cent; active tuberculosis of lungs, just under 1 per cent; tuberculosis of lungs, requiring observation, 3.8 per cent; tubercular glands of neck, 0.2 per cent; vaccination marks for smallpox, 44 per cent.

The benefits of such a medical examination, not only to the children, but to the school, and to the community are manifest. It should be made periodically. By such a survey, the school authorities have acquired information essential to an estimation of the progress of the school. They learn: (1) The number of pupils being retarded in their studies by defective vision or hearing. (2) The number of backward pupils who are being retarded by remedial physical defects such as diseased tonsils, nasal obstruction, malnutrition, etc. (3) The number of teaching days that were lost to these pupils because of preventable conditions.

Periodical medical examination of school children brings disease out into the open and challenges the effort for prevention in the community. It assists health authorities. Through such examination basic epidemiological information is obtained. It provides an inventory in the school records, of the various infectious diseases from which each child has suffered, and a record of any immunizing treatment, he or she, may have had, such as vaccination, or toxic-antitoxin. With this information, even in the event of an epidemic breaking out, it would not be necessary to close down the school. The non-immunized children could be quickly separated out, and dealt with as necessity demanded and the remainder could continue their work without fear of interruption.

Educational advantages being equal, the intellectual height reached by any community, will

be in accordance with its physical fitness and energy.

The economic benefits of medical examination to the community, cannot be easily estimated. There is, first of all, the possibility of substantially increasing the total progress made by each pupil in the school year, by keeping him physically fit, and the further saving that would be secured by reducing the days and weeks of absence from school because of ill-health; besides this, there is the manifest economy of avoiding the leakage of those who fall out entirely by a breakdown in health. As an example of the wastage of sickness caused by only one disease, there are at the present time in the children's ward at Fort Qu'Appelle, seventy children from the public schools of Saskatchewan, all of whom are suffering from tuberculosis. Periodic medical examination would assist more than any one thing in the early diagnosis and prevention of tuberculosis among our school children.

By the neglect of undernourishment, and physical defects among our school children, there is reared in every community a class of physical drones; the class who make a living in summer but are a public charge in winter. In their prime that are carried along as "dead wood" by their employers, and in after life, they form the bread lines in our cities, the army lined up under general debility in our hospital wards, they are the occasion of the ever increasing widows' pensions, and a cause of the continual extension of old folks' homes.

In conclusion, we find that educational facilities which are placed at the disposal of the children in our schools, are only partly used, because a large proportion of the children are suffering from remediable impairments; malnutrition, infected tonsils, adenoids, defective vision, or mental and nervous diseases, and because a number also harbour serious diseases of the lungs, heart and kidneys, that can only be discovered in the early stages by routine medical examination.

Among our immigrants, as shown by the 1923 Report of the Department of Health, Ottawa, out of 571 persons, which were certified as coming within the prohibited classes, 417 were not infectious, nor suffering from any loathsome diseases, but were merely physically defective, and liable to become a public charge.

In the past, the problems of health were famine, filth, plagues and epidemics. In the future, the problem will be in the physical unfitness of the survivors.

Can Hypersensitiveness Be Acquired?—Francis M. Rackemann, Boston, calls attention to the strong probability, based on circumstantial rather than on direct evidence, that hypersensitiveness can be acquired. At present, it is quite impossible to foretell which particular persons are likely to become hypersensitive in the presence of an adequate exposure. The reason why some do and some do not become hypersensitive is doubtless much the same as the reason why certain persons have more resistance to various infections than do others. As to the mechanism by which exposure to many different substances, most of them in the form of dust, can give rise to a definite hypersusceptibility, it is useless to speculate. Whatever this mechanism, it evidently develops slowly, since, in the cases cited, the duration of exposure before the appearance of symptoms varied from a few months up to ten years. Although hypersensitiveness in man differs from anaphylaxis in animals in many ways, nevertheless one would expect that, in persons with a truly acquired sensitiveness, positive skin reactions would be given only to the one particular substance. In the cases described by Rackemann, however, skin tests were given to several other and different substances in fourteen of the twenty-one orris cases and in twenty-eight of the thirty-six horse cases.—*Jour. Am. Med Ass.*, Feb. 14, 1925.

RESULTS OF OPERATIONS ON THE THYROGLOSSAL TRACT AND A NOTE ON THYROID SECRETIONS

A. P. Bertwistle, M.B., Ch.B., F.R.C.S. Ed.

Late Resident Surgical Officer, General Infirmary, Leeds

IT is well known that the results of surgical interference with fistulæ and cysts originating in the remnants of the thyroglossal tract are eminently unsatisfactory; especially is this so in the case of the former. Recently I detailed three fistulæ, seven cysts, including one near the foramen cæcum, and one adenoma which I investigated whilst resident surgical officer of the General Infirmary, Leeds.[1] One fistula was cured but a keloid developed; one was slightly improved; and one, previously operated on three times, was worse. Two of the cysts recurred almost immediately whilst four were cured as was the adenoma, though two cases developed keloid.

Three sequelæ are liable to occur:

(a) The conversion of a cyst into a sinus is a most aggravating occurrence; it did not occur in my series. It is caused by incomplete removal; subsequent infection causes the outpouring of fluid which prevents healing.

(b) The commonest complication is recurrence. Failure to remove the whole of the cyst wall is an obvious cause. There are several factors, however, which make an apparently complete removal, not so. As the tract has been observed in front of and even passing through the hyoid bone it has been supposed that it develops deep to the hyoid, and therefore the central portion of that bone must be resected; several successes have followed this procedure. Professor J. E. Frazer has proved conclusively, however, that the tract passes down superficial to the hyoid, but describes a loop of variable size behind that bone.[1] This means that in all cases the cyst must be followed up, well behind the bone. Examining my histological slides, Professor Frazer has noted that potential cysts are frequently present in the fibrous tissue surrounding the main cavity. At operation, therefore, a wide removal is necessary, if none of these are to be left behind. A very important factor is that sinuses are always infected and attention is only drawn to the cysts on becoming infected when they enlarge and become tender. The nature of the cells lining the cavity may influence the prognosis.

(c) Keloids, are more prone to occur in vertical than transverse incisions, the action of the platysma may be a factor. Needless to say all incisions should be transverse, in the line of a natural crease. It is quite impossible to hide a vertical incision by any means natural or artificial.

(d) Myxœdema has been reported after removal of a thyroglossal cyst by Sir Antony Bowlby.

A Note on Thyroid Secretion

One case revealed a most interesting feature. The history was as follows:

"A woman of twenty-eight was admitted with a small translucent nodule in the neck, exuding a thin serous fluid. She stated that this secretion was increased during mastication. According to her account it had existed six years, during which time it had occasionally ceased discharging. A swelling then appeared. This burst and the immediate discharge was a thick yellow fluid. On puncturing for injection purposes a honey-like fluid escaped."

This fact has been observed by several, thus Spencer[2] writes: "If the cyst is simply punctured or incompletely removed a sinus persists which discharges mucus as the patient swallows, although there is no communication with the mouth or pharynx." The cause of the increased discharge may be that the act of mastication squeezes out retained contents or it may be a point of extreme importance indicating that

the sinus shares in the activity of the salivary glands.

MacCarrison's work[3] has shown how intimately the thyroid's functions depend on those of the upper part of the alimentary tract, especially the stomach. Kendall[4] has found that thyrotoxin only affects the pulse if exhibited with amino acids, i.e. protein metabolites. It would be interesting to note experimentally whether there are volume changes in the gland after the injection of amino acids. It has been observed that in exophthalmic goitre, where secretion is at a maximum, there is often marked salivation. Is it possible that the sinus and thyroid gland function together and that by a freak of nature we are given an index of the secretion of a ductless gland? If the thyroid has an innervation identical with that of the salivary glands and functions pari-passu with them, new paths are opened up in the treatment of exophthalmic goitre. Just as in the dog Pavlov[5] has shown that, whilst sand introduced into its mouth causes a copious watery secretion and meat produces a viscid one, so various foods may affect the thyroid in different ways. Such a viscid salivary secretion as is produced under the influence of meat is also formed as the result of sympathetic stimulation. Meat may cause increased thyroid secretion apart from the action of its metabolites. Whether ligature of the superior thyroid arteries has any beneficial effect in exophthalmic goitre may depend on whether the periarterial sympathic plexus has been crushed or not.

My thanks are due to the *British Journal of Surgery* for permission to quote from my paper in that journal.

REFERENCES

(1) FRAZER, J. E. AND BERTWISTLE, A. P., *Brit. Jour. Surg.*, 1925, xii, 561. (2) SPENCER, W. G., Gask and Wilson's *Surgery*, 709. (3) MCCARRISON, R., *The Thyroid Gland*, 16, 17, 45, etc. (4) KENDALL, E. C., *Boston Med. and Surg. Jour.*, 1916, clxxv. (5) PAVLOV, P., *Le Travail des Glandes digestives*, Paris, 1903.

Death of Sir James Mackenzie.—In the death of Sir James Mackenzie, medicine has lost one of its most justly honoured leaders. He will be remembered best for his valuable contributions concerning heart disease and especially for his pioneer investigations on the irregularities of the heart, investigations carried out for the most part with the aid of the polygraph while he was a busy practitioner in a small town. These researches were not only of permanent value as an addition to knowledge but they served to stimulate others to productive work. Hardly less important were his trenchant criticisms, both destructive and constructive, of present-day methods of teaching and practice. In papers, addresses and books he emphasized the importance of the rôle that could and should be played by the general practitioner. He showed how the family doctor, better than the hospital physician, could study disease in its entirety, watching its progress from beginning to end; also how he could more intelligently study the development and meaning of symptoms of whose real significance we are still far too ignorant. Mackenzie was always an interesting writer, clear and forceful in expression. He was frank to confess ignorance when he was uncertain as to facts or views; but when he felt sure of his position he was dogmatic, blunt, bold in contradiction. If at times he seemed provincial in his read the writings of others, he repeated as new views; if, unwittingly, because of failure to what had been said before; if he was unduly severe in his strictures on the hospital and laboratory worker, he yet made lasting contributions to our knowledge of cardiac diseases, rendered yeoman's service in stimulating other workers, and pointed out serious defects in the medicine of the present and how they might be remedied in the medicine of the future. He was a medical Thomas Carlyle, growling at fads, tearing the mask from shams, preaching the doctrine of the equality of the lowliest physician with the mightiest, proclaiming the value of the fundamentals, the eternal verities of medicine, as against the transient, the popular or the merely traditional.—*Jour. A. M. A.*, Jan. 31, 1925.

XUM

Case Reports

A CASE SHOWING UNUSUAL DISTRIBUTION OF ICTEROID PIGMENTATION

JONATHAN MEAKINS, M.D., F.R.C.P., (Edin.)

C. G., male, aged thirty-seven years, a farmer by occupation, was admitted on February 1st, 1925, to the medical department of the Royal Victoria Hospital. At the age of seventeen years he had an attack of acute rheumatic fever which was complicated by a valvular lesion of the heart. Up to the age of thirty-seven years he was able to do the usual farm work without symptoms, but at this time he began to be troubled with slight shortness of breath and flatulence. This slowly but steadily became more pronounced until December, 1924, when the dyspnœa on exertion became extreme and œdema of the legs developed which necessitated him stopping work on December 20, 1924. On this date he noticed for the first time that he was becoming jaundiced. This persisted although it varied from time to time in intensity. On January 1st, 1925, he had an attack characterized by smothering sensations and great dyspnœa. Following this orthopnœa became pronounced and interfered with sleep. On several occasions there was severe precordial pain which radiated down the left arm to the fingers. It was brief in duration but was associated with great anxiety and fear of death.

On examination there was pronounced orthopnœa and dyspnœa, and at times the breathing was periodic. The lungs were normal except for numerous fine moist râles heard over both lower lobes behind; no sign of consolidation.

The cardio-vascular system revealed a cyanosis of mucous membranes and of finger tips; pronounced pulsation of the veins of the neck with positive venous pulse. Pulse, 120 per minute, regular, collapsing in character. Blood pressure was systolic 138 mm. Hg., diastolic 48 mm. Hg. There was œdema of the feet, legs, thighs, external genitals and back, also of the trunk to the level of the diaphragm. There was also œdema of the hands and arms up to the middle third of the arm.

The heart showed a diffuse heaving precordial pulsation; a moderate diastolic shock, and a diffuse apex beat with maximum intensity 16 cms. to the left of the M.S.L. which was accompanied by a fine systolic thrill. Over the aortic area a harsh, rasping, thrill, systolic, in time was felt. The first sound at the apex was replaced by a long, systolic murmur transmitted to the axilla but decreasing in intensity towards the sternum; the second sound was followed by a faint diastolic murmur in this area. On proceeding up the left side of the sternum towards the base a harsh, to-an-fro murmur was heard at the aortic area, the systolic murmur being of a different quality here than at the apex, and was transmitted into the veins of the neck.

The abdomen was distended, especially in the upper region. No ascites. The liver was palpable three inches below the costal margin. There was obvious pulsation both on inspection and palpation.

The electro-cardiogram revealed delayed auriculo-ventricular conduction and the Q.R.S. complex was suggestive of some interference with the conduction through the right branch of the bundle.

The diagnosis was chronic valvular disease of the aortic and mitral valves with aortic stenosis and insufficiency and mitral insufficiency (rheumatic in origin), with tricuspid insufficiency due to dilatation of the right heart, and chronic myocarditis with chronic passive congestion of all organs.

The interest in this case is to be found in the distribution of the jaundice. This was intense in the face, conjunctivæ and upper part of the trunk and arms. At the line of œdema it gradually faded and below this was not obvious. In the skin of the abdomen, back and legs, no icteroid discolouration was visible; the skin remained quite white. It was found that the distribution of the jaundice, so far as the skin was concerned, coincided almost exactly with the area where there was no œdema. The urine contained bile and the blood drawn from the median basilic vein gave a positive direct and a strongly positive indirect Van den Bergh reaction. The œdema fluid drawn from the feet and legs was found to be clear and colourless with no indication of icteroid hue. Both the direct and the in-

direct Van den Bergh reactions were negative. The patient stated that at no time had there been jaundice below the line of œdema, although he volunteered the information that the jaundice did not develop until after the œdema was well established.

At autopsy the clinical diagnosis was confirmed. Careful note was made of the distribution of the jaundice within the vessel walls. The aorta was deeply jaundiced as were also all of its main branches. Through the smaller branches the jaundice was less intense, but it could be traced even down to the smaller arteries.

The tissues where there was no œdema were deeply discoloured with bile pigments while in the subcutaneous tissues of the œdematous areas there was no evidence of any abnormal pigmentation. It would appear, therefore, as if œdema fluid free of bile pigments had been deposited in the subcutaneous tissues before the onset of the jaundice and that since that time little or no circulation had occurred through the œdematous areas.

If this supposition be correct it suggests a new and important conception of the circulatory conditions in cardiac œdema.

THREE CASES OF CREEPING MYIASIS IN SASKATCHEWAN

S. Harvey Corrigan, M.D., C.M.,

Lampman, Sask.

AND

Cecil Edwin Corrigan, B.A.,

Student Interne St. Boniface Hospital, Manitoba

Our excuses for offering this report are these: we cannot find that cases of this disease have been reported in Canadian medical literature, nor that any cases have been reported as having occurred in Canada. We find no record of any one outside European countries having claimed to have recovered the causative organism. Dr. A. E. Cameron, Professor of Zoology in the University of Saskatchewan, who has made exhaustive studies of bot flies, states that our observations are important and should go on record. For a study of the symptoms and treatment of this disease, readers are referred to standard text books on dermatology, which, however, give small space to the subject, and in some of the articles, we believe, certain fallacies exist.

For an intelligent grasp of the subject, a study of the life history and habits of several species of the Gastrophilus or bot fly is essential. One could not do better than to start with the excellent paper presented by Professor Cameron before the American Entomological Society at Pittsburgh in December, 1917 and which was published in the *Bulletin of Entomological Research* Vol. ix. part 2, September, 1918.

Professor Cameron tells us there are three species of the Gastrophilus in the prairie provinces. The horse is their favorite host and it was in defence of the horse that Professor Cameron, collaborating with Dr. S. Hadwen, made his studies for the Dominion Department of Agriculture.

Professor Cameron asserts that these flies never deposit their eggs on, nor insert them into the skin of the host, but always attach them to the hair. Those of *G. Nasalis* are found hidden at the base of the hair shaft in the intermaxillary area. Those of the *G. Hemorrhoidalis* on the hairs of the lips, preferably the lower lip. Whilst the *G. Intestinalis* deposits its eggs chiefly on the hair of the shoulders, fore legs, and mane; less freely on the hair on other parts of the host's body. The eggs of the first two named may hatch unaided, and some of the larvæ burrow into the integument of the host. Those of the *G. Intestinalis*, however, require moisture and friction and this is supplied when the horse licks the area where the eggs are attached to his hair. In this way the newly hatched larvæ are carried to the mouth, where they burrow into the mucous membranes; unlike the larvæ of the other two species named, the larvæ of the *Intestinalis* are unable to burrow into the hairy integument.

Professor Cameron cites an incident where a man, watching an adult *G. Hemorrhoidalis*, saw the fly deposit an egg, attaching it to a hair on the back of the observer's hand. Stelwagon in his *Diseases of the Skin*, (page 1149,) states that Sokolow claims to have recovered the larva of what he believed to be the *G. Hemorrhoidalis* from a lesion in man and that he found black nits or eggs, on hairs adjacent to the burrow. Eggs of this species are distinguished from those of

the other two species named, l y their dark colour. It would appear that his identification was correct.

Our three cases occurred in August, a month when bot flies are active. All patients were farmers working with horses. The lesions were situated on the upper arm, the extensor surface of the wrist and the extensor surface of the middle finger. In clinical appearance the three cases were much alike. The patients were not sick, and complained only of local irritation. In all the cases we confirmed the observation of Samson Himmelstjerna that, by pressing a piece of clear glass over the advancing end of the burrow, a minute dark spot is visible.

In our efforts to recover the organism, we infiltrated the skin with procaine and adrenalin. In our first two cases we failed, but our work apparently cured the disease, as there was no further progress and the lesion soon disappeared. In our third case, August 1924, we succeeded in obtaining a larva and sent our specimen to Professor Cameron. We quote from his letter, "I have no hesitation in stating that your specimen is the maggot of the *G. Intestinalis*, probably in the first or second stage of its growth; I am very pleased that you have been able to show that the Gastrophilus maggots do penetrate the skin of the host directly."

Our specimen, of which we furnish a microphotograph, measures in length 1 mm.. at its greatest width .1 mm. One may see it is not easily recoverable.

Larva of Gastrophilus Intestinalis recovered from lesion. (x 75).

It has also been shown that the eggs of the *G. Hemorrhoidalis* have appeared on hairs adjacent to an active lesion on the human skin. The eggs of this species on the equine host, hatch unaided and the larvæ burrow into the integument, so it may do the same in the human host. The eggs of the *Intestinalis*, however, hatch only with the aid of friction and moisture, so we infer that in our cases the newly hatched larvæ were received accidently from the horse to the human skin, into which we now know the larva of this species can burrow.

Our three cases having occurred in one field of practice in a period of four years, would lead us to think this disease may be more prevalent than our literature would indicate. As we have seen that man can be infected with the larvæ and bot flies are prevalent in every province, all cases of creeping myiasis should be carefully studied, the causative organism recovered and identified, and the patient receive some follow up attention.

In our third case, one of us recovered the larva of the *Gastrophilus Intestinalis* thus showing that creeping myiasis may occur in Canada. We have failed to find any previous record that the larva of this species have ever before been recovered from the human host. In our case this particular larva burrowed directly into the human skin, something which it appears unable to do in the equine host.

Our thanks are due Dr. F. Cadham, Chief of the Bacteriological Department, University of Manitoba, who measured our specimen. Without the kind advice of Professor Cameron and the perusal of his excellent treatise, these interesting cases would not have been reported. We are greatly indebted to him.

A CASE OF EPIDERMOLYSIS BULLOSA

C. R. Bourne, M.D.

Assistant in Medicine and Dermatology, Montreal General Hospital.

F. H., a Jewess of thirteen years has always been healthy. The parents are Russian Jews, not related, and all her relatives have been free from skin disease.

Her mother noticed bullae on the hands and feet before she was two weeks old, and, subsequently on the parts which were subject to pressure. These were always worse in the summer but did not quite disappear at any time. The extremities were usually affected, but occasional lesions appeared elsewhere. The condition has been progressive. Two weeks before our observation the bullae on the face and hands were more extensive than ever, and in June 1924 she came to the Montreal General Hospita' Skin Clinic under Dr. G. G. Campbell, to whom I am indebted for the privilege of reporting the case.

When examined, the bullae were distributed on the outer surfaces of the arms and on the

palms and feet, especially where there was pressure from the shoes. They varied in size from a five to a fifty cent piece. Some were recent, tense, intact and filled with a clear pale yellow fluid; others had ruptured and were covered with whitish epidermis or were raw where the covering had been rubbed off. Some of the unruptured bullae on the feet became turbid or haemorrhagic. There were relatively few scars, but deposits of brownish pigment remained after a few of the lesions, especially on the arms.

FIG. 1.—Epidermolysis bullosa. Bullae recent and ruptured caused by pressure from footwear.

Under observation in a hospital bed the lesions disappeared without scars. By rubbing the skin of the extremities with the finger for a minute or two, redness appeared in five to ten minutes. This was followed by elevation and oedema, and, on the following day a vesicle appeared which gradually enlarged into a bulla covering the area of friction. Prolonged rubbing had the greatest effect. Slight friction produced redness which gradually subsided, without apparent trace; but there was evidently a loosening of the epidermis from the corium, as it could, later, be removed by slight rubbing. Whilst under observation in hospital, a bleb—the size of a dime—appeared at the inner end of the left clavicle and we were able to demonstrate the shirtband as the cause. The buttocks, back and abdomen were free during three weeks in hospital.

The heart and lungs were normal. Blood pressure was 120-70 (Tycos). The abdomen and glands were normal. The mucous membranes were unaffected. The appetite was good and the bowels usually regular. Temperature, metabolism, urinalysis and menstruation were normal. Blood smears were normal and sweating was not increased. The nails were slightly ribbed, irregular and thickened but were not atrophied. The nervous system was negative. There was normal response to light touch, heat and cold, pain and pressure.

One week after discharge from hospital the patient appeared at the clinic wearing sandals with stiff leather tops. There was a recent crop of tense unruptured blisters where the footwear pressed. Dr. Campbell, then, suggested the wearing of felt shoes.

FIG. 2.—Epidermolysis bullosa. Remains of ruptured lesion in mid-palm. Recent bullae lower down.

A week later, single small pea-sized vesicles had appeared on the upper lip and on a finger and the lesions on the feet were drying up.

Comment

Epidermolysis bullosa is a rare cutaneous malformation, usually hereditary and congenital, but one which occasionally does not manifest itself until adult age.

The lesions consist of small and large serous blisters, exceptionally partly haemorrhagic, on the parts subjected to friction from the wearing apparel or from knocks or pressure. The bullae are formed in healthy skin and do not occur without pressure. The affection is usually confined

to the extremities, ears, knees and elbows. The mouth is rarely affected. The bullae develop within an hour without pain, and disappear readily without trace, except possible pigmentation, provided secondary infection is avoided. There is a special tendency at the nail ends, leading to nail loss and atrophy. The general health is not affected. Excessive sweating is usual.

The skin of certain regions becomes gradually thin and atrophic like an onion peel and of a brownish-red colour. Milium-like epidermal cysts (white opaque granules) appear, consisting of connective tissue.

The process is a congenital irritability of the vascular supply of the derma with disappearance of the papillary body. With slight trauma the basal portion of the rete is constantly bathed in a serous transudation. The loosely attached rete separates and the bleb is formed. With the advance of years the condition usually diminishes or becomes localized.

Treatment on the whole is unsatisfactory. Puncturing the vesicles when small, retards their growth. Where possible pressure and friction should be avoided. Soothing applications are indicated for excoriated surfaces and infected areas require mild antiseptic lotions.

CASE OF STREPTOCOCCUS SEPTICÆMIA CURED BY MERCUROCHROME*

I. H. Noble, M.B.

St. Luke's General Hospital, Ottawa

A girl, age seventeen, was admitted on November 3, 1924, complaining of severe, generalized abdominal pain of two days' duration, profound nausea, and, at the onset, vomiting. Apart from a purulent discharge from the right ear for five days previous, her general health had been excellent. Family history quite negative. Bowels somewhat constipated. No menstrual disturbance. The patient states she passed very little urine during the two days previous to admission.

Examination on Admission.—The temperature was 105°, pulse 116, respirations 24. Her face very flushed, expression anxious, tongue dry and brown; there were sordes on the lips and a brownish serous discharge from the teeth. She appeared acutely ill. The right ear drum was found to be perforated in the posterior inferior quadrant and a thick yellowish purulent discharge exuded. The left ear drum was normal. The teeth were in good condition. The tonsils were buried and appeared diseased, but not acutely inflamed. No palpable lymph glands in the neck.

Thoracic examination yielded negative results. The heart was within normal limits; the sounds were normal, pulmonary second sound was accentuated. Abdomen, slightly distended, with moderate bulging of the flanks, very little movement with respiration, generalized tenderness most marked in the right iliac fossa. No demonstrable evidence of free fluid. Marked rigidity throughout the abdomen (this disappeared after an enema was given), liver, spleen, and kidney not palpable, nor were there any palpable masses. Nothing of note in the nervous system.

Laboratory findings.—White corpuscles 19,600, 85 per cent polymorphonuclears. Red blood corpuscles 4,800,000; haemoglobin, 85 per cent. Blood pressure 124/82.

Urinalysis.—Specific gravity 1016. Albumin a trace; no sugar; no acetone; occasional red and white blood cells; a few hyaline and granular casts. Blood cultures showed pure growth of *Streptococcus pyogenes.* Direct smears and cultures from the aural discharge showed the same organisms.

Mercurochrome, 220 soluble, 20 cc.'s of 1 per cent solution was given intravenously daily from November 5th to November 15th, 1924, during which time the temperature ranged from 102° to 104° in the evenings, and from 97° to 99° during the morning. Urinalysis from November 8th and daily afterwards revealed no abnormality. On November 8th the patient complained of pain in the right big toe and two days later, severe pain in the left scapular region. These pains were attributed to the occurrence of emboli although no petechiæ were found; the pain subsided within three days.

From November 15th to November 20th the temperature ranged from 97° to 100°, and from thence till the patient's discharge on December 4th the temperature remained normal. Blood cultures taken on this date were negative and the patient was discharged feeling very well.

*Reported by the kind permission of Dr. Alford.

MULTIPLE ULCERS OF THE DUODENUM AND STOMACH. WITH DIVERTICULUM OF THE DUODENUM. PERFORATION OF THE DUODENUM AND PULMONARY INFARCT*

R. A. H. MacKeen, M.D.

Montreal General Hospital, Montreal

The patient is a male aged sixty-three years. He was admitted to the hospital into the service of Dr. E. M. Eberts, on October 26th, 1924, complaining of pain in the abdomen and vomiting.

The patient was born in Canada and had always lived here. The family history is irrelevant. Until five years ago he had enjoyed good health, and followed the occupation of a labourer. For the past five years he had had periodic attacks of indigestion, which he said came on in the winter. These consisted of abdominal pain, eructations of gas and nausea. There was no vomiting. The pain came with the onset of hunger, and was relieved by taking food or hot water. He was wakened frequently in the night by the pain. During the past two years he had lost from eight to ten pounds. For ten or twelve days previous to admission he had been nervous, sleeping poorly, and at times weeping and threatening to take his life. His bowels moved regularly, and he suffered no pain until October 25th, the day before admission to the hospital, when he complained of slight abdominal pain. He took food which gave relief and there was no vomiting.

On October 26th he awoke with abdominal pain which gradually became worse, and at noon of the same day, he suddenly complained of severe stabbing pain in the abdomen. About two o'clock while on his way to the hospital, he vomited once. The vomitus was of a watery character.

Condition on admission. The patient was well developed but poorly nourished, and was moaning with pain; his face was pinched and ashen. The heart sounds were normal. Pulse 92, good volume. Lungs were slightly emphysematous anteriorly. Posteriorly they showed some hypostatic congestion and a few moist râles. Abdomen was flat and immobile. About the umbilicus, most markedly on the right side, there was tenderness on palpation and general splinting of the abdominal muscles.

Liver dullness was diminished. There was no movable dullness in the flanks. Rectal examination was negative. A diagnosis of perforated duodenal ulcer was made, and the patient operated on at once by Dr. R. B. Malcolm. There was some free fluid and gas in the abdominal cavity. At the beginning of the duodenum there was a perforated peptic ulcer, the perforation being about the size of the tip of a lead pencil and duodenal contents were escaping.

The perforation was quickly closed with a purse string chromic catgut suture, which included all the coats of the duodenum. This was followed by a peritoneal suture. The gastrohepatic omentum, which was fairly loose, was brought down and used to cover the line of sutures. The man's age and general condition was such that it was deemed inadvisable to do any more at this time. "Bipp" was applied to the incised wall both before the peritoneum was opened and after it was closed.

The immediate post-operative convalescence was very satisfactory. On October 30th, four days after operation, the patient was put on Lenhartz diet. This was continued and he had several soap enemas, and appeared to be doing well, until midnight on November 8th, the thirteenth post operative day, when he complained of slight tenderness in the right flank. There was no pain. Pulse 82 and regular. One hour later he groaned once, became cold, was seen to perspire profusely and gasp for breath. His pulse was small and rapid. Within five minutes he was in a state of extreme collapse, perspiring profusely and breathing with extreme difficulty. Every effort was made to give him relief, but it was of no avail, and he died within an hour.

Synopsis of post mortem findings.—The site of operation shows a normal reaction and the perforation in the duodenum is tightly closed. There are old fibrous tissue bands about the first portion of the duodenum.

The stomach and duodenum with the adjacent organs and tissues are removed *en masse*. On the posterior aspect of the duodenum and 2 cms. from the pyloric ring, there is a round knuckle-

*From the Pathological Laboratory of the Montreal General Hospital.

like protrusion, which communicates with the lumen of the duodenum, and is united to the adjacent tissues by old fibrous bands. When the stomach and duodenum are opened the following is seen. There are gross ulcers in the stomach and duodenum. The ulcers in the stomach are six in number and within 3 cms. of the pyloric ring. These ulcers in the stomach are evidently acute. There are two on the anterior surface which are 5 cms. in diameter, are pale in colour, have raised edges with ulcerated centres containing bright red blood. Just opposite these on the posterior surface, are four small ulcers, similar in appearance. Distal to the pyloric ring and within 0.5 cms. of it are three more ulcers. Two of these are evidently acute, one being that which had perforated previous to operation. On the posterior surface of the duodenum, 2 cms. from the pyloric ring, and corresponding in position to the above mentioned pouch, is a diverticulum 1.5 cms. deep, and capable of admitting the little finger. It is surrounded by a hard white fibrotic ring. This has evidently developed from a chronic ulcer.

Lungs and heart.—On opening the right pulmonary artery, a large embolus is seen at the main bifurcation, completely blocking the lower branch for a distance of two inches, and with a small portion hanging in the upper branch. The lower lobe of the right lung presents a large fan-shaped sharply defined, purplish black area, which corresponds to the area supplied by the blocked artery. Examination of the heart and larger venous channels fails to show any site from which the thrombus might have been dislodged.

Remarks.—Multiple ulcers of the duodenum and stomach in the same individual are not common, and their association with a diverticulum of a duodenal ulcer is still more rare. The origin of the pulmonary embolus was not demonstrated, probably because it was attached to one of the veins by a narrow attachment and all of the thrombus became displaced. To this untoward accident, the patient's death is attributed.

Atypical Forms of Epidemic Encephalitis.—A. V. Neel draws attention to the frequency of obscure conditions the relation of which to epidemic encephalitis would not be suspected unless a careful study were made of the history of the case. The development, at a comparatively late stage, of after-effects similar to those following an attack of epidemic encephalitis is significant. In 1923 the author examined forty patients three to six months after they had suffered from one or more attacks of severe hiccup, and in 80 per cent he was able to demonstrate more or less definite clinical signs of epidemic encephalitis. The fact that the rise in the number of cases of this disease synchronized with the rise in the number of cases of epidemic hiccup further stressed the likelihood of an etiological connection between the two. The author publishes details of ten cases observed late in 1924, and of interest because of their suspected relationship to well defined epidemic encephalitis. In two of these cases an attack of persistent hiccup recurred, being about three years, and in the other case the interval in one case between the two attacks almost four years. In both cases there were attacks of giddiness and the ocular symptoms which are common in epidemic encephalitis. In one case there was paresis of the right arm. In a third case there was persistent hiccup day and night for three and a half days, associated with a sensation of feverishness; but there were no signs of coryza, and there was no previous history of hiccup. This patient, who was a man aged forty-nine, had contracted "influenza" in the summer of 1918, with much drowsiness. At the same time one of the seven children at home also fell ill. Since then he had had disturbances of vision, and Neel believes that ever since the summer of 1918 this patient had been suffering from a mild and abortive form of epidemic encephalitis which, in December, 1924, flared up in the form of epidemic hiccup.—*Ugeskrift for Laeger*, December 18th, 1924, p. 1013.

Editorial

A NEW TREATMENT FOR TUBERCULOSIS UNDER TRIAL

THE aim of medicine should be to prevent diseases, but under conditions as they are to-day a search must be made for specific remedies for diseases already present. Professor Holger Moellgaard, of Copenhagen, is at the present time attempting to find a cure for that world-wide disease, tuberculosis, in a compound of gold and sodium ("Sanocrysin" or sodium aurothiosulphate). Koch, in 1890, showed that a salt of gold is inimical to the growth of tubercle bacilli in a solution as weak as one in a million. This was the starting point of the work of Moellgaard; American investigators had also begun experimenting with gold in the treatment of the disease in animals.

Much experimental work upon animals infected with bovine tuberculosis has been carried out in Denmark. It is claimed that sanocrysin has advantages over other preparations of gold in that it is soluble in water, is readily diffusable, and is slowly decomposed in the body without giving rise directly to poisonous substances. It checks the growth of bovine tubercle bacilli in a solution of one in a million and inhibits it completely in a solution of one in one hundred thousand, the lipoid membrane of the bacillus being penetrated to some extent by the metal ions.

Calves and guinea pigs were injected subcutaneously with bovine tubercle bacilli and the site of inoculation was then infiltrated with sanocrysin. Some of these animals remained free from tuberculosis whilst all the control animals died of the generalized form of the disease. A violent reaction, apparently similar to, and probably identical with, the shock brought about by a large dose of tuberculin given to a tuberculous animal, resulted in the animals treated with sanocrysin. Moellgaard discovered that this reaction could be prevented, or at least greatly lessened, by an injection of serum obtained from a tuberculous animal. This is explained by the idea that the serum contains antitoxins which neutralize toxins liberated when the sanocrysin destroys the bovine tubercle bacilli. Animals which had received the serum reacted to sanocrysin with fever, a rash, loss of weight, and diarrhœa; while those which had not been injected with serum reacted with a fall of temperature, albuminuria, myocarditis, and œdema of the lungs. It is claimed that therapeutic doses of the compound (0.01 to 0.02 gm. per kilogram of body weight) had no ill effects in a non-tuberculous animal but given to tuberculous animals the same doses gave rise to all the reactions that would be expected to follow from a destruction of a large number of tubercle bacilli in the tissues. Again, after clinical cure had been attained by continued treatment of tuberculous animals with sanocrysin for some time the ex-tuberculous animals no longer showed a reaction to the drug.

By November, 1923, Moellgaard had arrived at his method of treatment of tuberculosis, *i.e.*, sanocrysin plus an antidotal serum; Moellgaard used a serum obtained from horses injected with dead bacilli defatted by Dreyer's method. Since that time Dr. K. Secher has undertaken clinical tests with this form of treatment. In a recent paper Secher describes the tuberculin-like reaction following the injection of the drug in tuberculous patients. At first a considerable number of patients died; nine in all, two from shock, three from Herxheimer's reaction, three from poisoning with vomiting and hiccough, and one from cachexia. Twelve slight cases of pulmonary tuberculosis were treated; three of these were sputum-positive and all were rendered free of symptoms. On the other hand only two of the twenty-one patients with severe disease were made free of

symptoms. At the present time, with the new knowledge gained, patients may be treated who would formerly have seemed unsuitable. It is stated that three patients suffering from miliary tuberculosis were treated, one of whom was discharged as much improved, and one as cured; twelve cases of acute pleurisy were treated and eleven were sent out as symptom-free. The treatment in surgical tuberculous cases apparently shows little effect and the reaction is too severe for treatment of tuberculosis of the eye. Rovsing has reported good results in the local treatment of tuberculous cystitis. Secher also showed that after three or four doses of sanocrysin no further reaction is seen in successfully treated patients as Moellgaard found in the case of animals.

It is only just to point out that certain criticisms have been raised by a comprehensive editorial in the *Journal of the American Medical Association* of February 14th. The experiments on animals were not carried out with tubercle bacilli of the human type and no mention is made by Moellgaard of any effort to treat spontaneous tuberculosis of cattle. Again, the animal experiments fall into so many subgroups with only one control for each, that it is impossible to judge the significance of the outcome. And finally, the writer considers, that the evidence is not conclusive enough to justify the explanation offered by Moellgaard for the severe reactions obtained, *i.e.*, the liberation of toxins from tubercle bacilli killed by the sanocrysin. It is pointed out that local and constitutional effects of many salts of gold have been studied, and the writer is of the opinion that most of the intoxication is produced by the drug itself.

The Danes acknowledge that further experimental work is necessary and we note with pleasure that the British Medical Research Committee is investigating the treatment of clinical tuberculosis in several hospitals in London.

ARCHIBALD MALLOCH

STUDIES IN ADDISON'S DISEASE; THE MUIRHEAD TREATMENT

IN an interesting paper on Addison's disease read at the Annual Meeting of the Association of American Physicians (*Jour. Am. Med. Ass. Jan. 31, 1925*), Dr. Rowntree of Rochester, Minnesota, presents the encouraging results obtained from the use of what he has termed the Muirhead treatment. For the use of the name he gives the following story; in the spring of 1920 Dr. A. L. Muirhead, Professor of Pharmacology at the Creighton University College of Medicine, Omaha, presented himself at the Mayo Clinic suffering from Addison's disease in an advanced stage. In consultation with the doctor, careful consideration was given to the existing conditions, to the previous treatment, and to the possibilities of forced endocrine treatment. It was agreed that he was to keep a detailed record of the results obtained, and he was furnished with an apparatus for the study of the blood pressure. Epinephrin was given hypodermically and by rectum three times a day, and the whole gland by mouth three times a day, in doses that represented his maximum tolerance. Gratifying improvement resulted; so gratifying indeed that he described his experience under the title of "An Autograph History of a Case of Addison's Disease" (*Jour. Am. Med. Ass. March 5, 1924*). The improvement unfortunately lasted only a few months. Since this experience the regimen, which has been termed the "Muirhead regimen", has been employed in eleven of twenty other patients in the clinic, who were suffering from this affection. To these Rowntree adds available data regarding twenty-seven cases observed in the Mayo Clinic previous to 1920. These forty-seven cases treated since January 1912 in the Mayo Clinic represent approximately one in every 6,000 patients. Males were more

frequently affected than females in a ratio of two to one. The average age at onset was approximately forty years. One case was only fourteen years of age. The diseases that appear to have an important etiological influence on its development were as follows; influenza in twenty-seven cases, pneumonia in twelve, and tuberculosis in eight cases.

The principle of the treatment is the frequent administration of epinephrin hypodermically and by rectum, and of whole gland or suprarenal cortex by mouth to the point of tolerance which varies widely in each individual case. The untoward results which may appear from the hypodermic administration of epinephrin are a feeling of general weakness and tremor, with palpitation or pounding of the heart; from its rectal injection, tenesmus; and from the employment of the whole gland or cortex by the mouth, gastric or abdominal distress, nausea, vomiting, and intestinal cramps. The only other therapeutic agents made use of were rest, moderate exercise, diet, outdoor life and sunshine. During the advanced stage and during shock rest was absolute and artificial heat was supplied. In stronger patients moderate exercise, fresh air and sunshine were deemed desirable. Because of the low level of the blood sugar, the diet was directed to be rich in carbohydrates with feedings at regular and frequent intervals. Fruit juices and milk were administered between meals and once during the night. A small dose of epinephrin was given by proctoclysis during the early morning hours to patients extremely ill. The breakfast should be simple in form and easily digested. Acidosis is best controlled with alkalies. Continuous nausea and vomiting may become most distressing at times, and may require withdrawal of all food for twenty-four hours. Glucose has been used intravenously in such cases with benefit. Of the twenty-one patients admitted to the clinic since January 1920, four who received no organotherapy died within three or four months; four who received some form of organotherapy died also within a few months, but the fifth who received a portion of whole gland by the mouth three times a day and i c.c. of epinephrin in 1-1000 solution daily by rectum lived sixteen months. Of the twelve patients on the Muirhead regimen, five are dead and seven living. Of those dead two died within two to four weeks of admission; in both these a shock like condition existed, and there appeared to be much intolerance of all attempts at organotherapy. One of these two patients had been placed on a regimen involving organotherapy six months before coming to the clinic and improvement had been striking at first. Two other patients of this group improved definitely following the treatment. One exhausted her supply of suprarenal preparations and before another supply was obtained fell into a comatose state ending in death. Another patient lived seven and a half months from the beginning of the treatment but finally died in coma. Seven patients are still living, two of whom have been under observation for periods too short to justify a report. Three patients are living, apparently in excellent health, and are continuing treatment after the lapse of twenty to twenty-six months. Two others continue to improve after thirteen and nineteen months respectively. Rowntree lays emphasis on this improvement which has accrued under forced organotherapy. The results certainly exceeded expectations in several instances. The prognosis in Addison's disease is always extremely grave, and since nothing better is available, the Muirhead treatment should be given a trial in every case, but care must be exercised to see that the patient's individual tolerance is cautiously determined and that every measure is utilized in combating the associated symptoms.

DIOXYACETONE

THE employment of a sugar in the treatment of diabetes has at first sight a somewhat paradoxical appearance, but the report we publish in this issue of recent work done by the department of metabolism at the Montreal General Hospital, shows the possibilities contained in such a method. Dr. Rabinowitch has set forth the results obtained by treating diabetics with a form of sugar whose chemical constitution is similar to one of the products of the normal breaking down of the sugars in the body. By the use of this less complex sugar (dioxyacetone) he would provide the tissues with a substance with which they can more readily deal: that is, they are given a sugar derived from glucose; they are not called on to split the glucose molecule themselves, for in the diabetic that is the work which the metabolic machinery cannot thoroughly perform.

The experimental evidence as to the occurrence of this substance during the metabolism of glucose in the tissues, seems to be fairly complete, and is the basis for the reasoning behind this line of treatment. It is to be added that dioxyacetone has the same food value as glucose, and has also the ability to aid in the complete combustion of fat, thus preventing the formation of ketone bodies; that is, it is anti-ketogenic. Therefore it is expected that as a result of its use the patient may safely take more food and so preserve the body weight; and, if more food can be so taken, less insulin will be required. Not that insulin will be replaced, but its action will be rendered less necessary and it will require to be given less frequently.

The comparative effects of glucose and dioxyacetone have been well brought out by Dr. Rabinowitch, but as the number of cases in which it has been used is small, more work is necessary before the use of this sugar can be strongly advocated. Certain points must be cleared up; why, for example, in some cases, if dioxyacetone is supplied in large amounts, it is built up again into the more complex glucose molecule, instead of being broken down still further. And again, the amount to be administered in any given case cannot yet be reduced to a standard, but has to be decided by careful study.

We understand that a quantity of the sugar has been obtained by the Montreal General Hospital, and will be used in a further series of cases. The results of these more extended investigations will be awaited with interest.

H. E. MacDermot

MATHEMATICS AND THE PHYSICIAN

> "The laws by which God has thought good to govern the Universe are surely subjects of lofty contemplation; and the study of that symbolical language by which alone these laws can be fully deciphered, is well deserving of his (man's) noblest efforts."
> —*Professor Sedgwick.*

THE use of mathematics in medicine is often objected to on the basis of its difficulty. In the great majority of instances, however, it may be said that the difficulty is not due to the mathematics, but to the complex nature of the particular phenomenon studied. Are mathematics necessary? A great advance that medicine has made during the last quarter century has been the application of metabolism studies to disease. By metabolism is meant the study of the chemical and physical changes which occur in the living cell. Thus scientific medicine attempts to apply the same physical sciences to the investigation of disease, as are employed in the investigation of the fundamental phenomena of matter. All known fundamental phenomena of matter obey chemical and physical laws. Every known chemical and physical law can be represented by a mathematical equation.

Since this is so it follows that no material phenomenon is perfectly understood unless it can be expressed mathematically.

In the exact sciences, generalizations or laws are derived by one of two methods, theoretical and empirical. In scientific medicine the latter method is employed. The empirical method consists of the collection of abundant material, by suitable observations, regarding two or more phenomena between which correlation is to be established. An attempt is then made to give mathematical expression to this correlation.

Kant, in 1786, stated "that the claim of any particular branch of natural philosophy to be considered as a science, can be assessed only on the basis of the amount of mathematics employed in it."

From all of the above considerations the necessity of mathematics appears obvious. Research students of medicine appreciate this.

The most superficial survey of more recent journals of medicine furnishes evidence of the persistent efforts being made in the study of the phenomena of life in health and in disease. No one branch of natural philosophy, biology, physics, chemistry, physical chemistry, etc., escapes attention. In these, mathematics plays no small part. Mathematics is employed constantly in the coordination of experimental results. The efficiency equation may be applied to such studies as hæmolysis, precipitation phenomena, and the dissociation of oxyhæmoglobin. The integral calculus and trigonometrical ratios may be made use of in animal mechanics (muscular action). Thermodynamic equations find numerous physiological applications and the law of organic growth is demonstrated in many biochemical problems. Medical statisticians apply the laws of probability, and nomographic or alignment charts are in daily use in the calculation of the body surface and basal metabolic rate of the individual. Mathematics is a powerful tool.

I. M. Rabinowitch

A RECENT EPIDEMIC OF TYPHOID FEVER AND ITS CAUSE

TYPHOID fever is a disease which should be practically wiped out of the mortality rates in modern civilized life, but accidents will occur. During the months of last November, December and January a marked increase appeared in the number of cases reported in many cities in the Northern States; in New York beginning the third week of November, and in Chicago towards the end of the fourth week of the same month. In both cities the majority of cases occurred among the well-to-do, who were accustomed to indulge in the eating of raw shell fish. A few cases only were said to have been traced to water drunk outside the city limits, and a small group were attributable to a certain supply of ice cream. In neither of the cities was there any evidence of the epidemic being due to the civic water or milk supply. An excellent report of the prompt measures taken by tne Department of Health in the City of Chicago appears in the *Journal of the American Medical Association* of February 28th, 1925. In this article the date of onset in Chicago was placed on November 30th, 1924. because on that date four new cases were reported. Special investigations were at once set on foot to determine whether the water supply was free from contamination; and at the same time all the more important oyster dealers and ice cream dealers had their supplies sampled and tested. On the following day, as suspicion fell chiefly upon oysters as being the cause of the trouble, the local dealers were warned that steps would be taken to safeguard the product for the Chicago market; and on December the 9th, as the number of cases reported had increased considerably, a warning against eating raw oysters was broadcasted by radio. The next morning all the oysters supplied by a certain number of oyster dealers were withdrawn from the market because their products show-

ed excessive bacilli coli scores; on January 2nd, without a permit no oysters were allowed to be sold in the city.

Within the period from November 15th, to January 15th the number of cases of typhoid fever above the small average of previous years was in the neighbourhood of 650 in New York, 100 in Chicago, and 50 in Washington. A careful investigation of a large number of individual cases by public health officials was made in each of these cities, sufficient to give a clear epidemiological picture of the whole situation, with the result that the main factor in the spread of the infection was shewn beyond reasonable doubt, to be due to the eating of shell oysters distributed by a large producing company operating in the vicinity of New York. The conclusions arrived at by the United States Public Health Service and published were "to the effect that the general supply of no large distributor of oysters was uniformly infected, but that oysters infected in one or more beds, or parts of one or more beds, or at one or more floats, and constituting but a small proportion of the total, had been unfortunately introduced into and distributed with a large supply of oysters of good sanitary quality."

The publication of this report startled, and aroused great interest among the public and among all purveyors of oysters. Dealers claimed that what they termed "the typhoid scare" resulted in a loss of 30,000,000 dollars to the industry. This unfortunate epidemic so disastrous to life emphasizes the necessity of a persistent examination, inspection and regulation of the waters both American and Canadian, where oysters are grown. In the report from the Chicago Board of Health it is stated that one of the causes which may have contributed to this epidemic was the fact that two local oyster men, a father and a son, had undoubtedly been suffering from typhoid fever, and both had worked over the oyster beds during the incubation period of their sickness. It was also learned that there were no toilet facilities on their boat, and the human discharges were simply dumped overboard, and until the son became sick arrangements at their home in a nearby village for bedside sterilization of bodily wastes from the father were not made. These wastes were discharged directly into the town sewer system and thence into waters in the neighbourhood of the oyster beds.

A study of a seven year average range for typhoid fever in Chicago and the general seasonal trend of the disease reveals a sharp uplift of the curve in November, 1919, 1920 and 1924, for which no cause was discovered. In 1918, 1921, and 1922 this increase did not occur. It is not beyond a reasonable assumption that the increase in these years may have been due to the consumption of contaminated oysters.

A MEMORIAL TO SIR JAMES MACKENZIE

THROUGH the columns of the *British Medical Journal* (Feb. 21. 1925) we note that an appeal is now being made for contributions to meet the cost of maintenance of the Institute for Clinical Research at St. Andrews, established by Sir James Mackenzie five years ago.

Through Mackenzie's own efforts and his great generosity in providing money, the building together with a well equipped bacteriological and chemical laboratory is the property of the Institute, and he himself with the assistance of a few personal friends have from year to year met the current expenses. It was his ardent hope that the work he began there would be permanent, and no effort is being spared by the council and staff of the institute to give effect to the aims he had in view. It has been ascertained that a sum of about £60,000 will be required to produce the minimun income necessary for the scheme, and of this amount £7,000 has already been collected. The institute in the future will be known as the James

Mackenzie Institute for Clinical Research, St. Andrews. Donations towards securing its establishment as a permanent memorial to its distinguished founder will be gratefully received and acknowledged by the Honorary Treasurer of the Institute, Commercial Bank, St. Andrews.

THE TRUDEAU SANATORIUM 1885-1925

THE present year is the fortieth anniversary of the foundation in the Adirondack region of the institution that bears the name of Edward Trudeau, and the *Journal of Outdoor Life* has made it the occasion for publication of a special memorial edition filled with tributes to the work accomplished by this pioneer in an important field of therapy. The story of Trudeau's life from early manhood is a story of courage surmounting difficulties that would have thwarted the ambitions of most, and is an inspiration to all. An indomitable will to succeed, associated with a spirit of self-sacrifice and devotion to service, was the secret of his success in life. He was the embodiment of the spirit of helpfulness to others. Owing to his enthusiastic efforts a sanatorium was established which soon became a great educational centre, in which above all other methods of treatment emphasis was placed on the importance of rest and fresh air. Edward R. Baldwin, at first a patient and later an assistant in his work, asserts that only when a survey of the past forty years is made, can we appreciate how much the American profession owes to this Trudeau Sanatorium. The numerous physicians who passed through that institution as patients carried throughout the whole country the knowledge, gained during their residence in it, of the value of rest as a fundamental principle in the treatment of tuberculosis. Allan Krause in his contribution maintains that Trudeau also was the first investigator to grasp the principles under which immunity occurs in tuberculosis. Before 1900 Trudeau had stated definitely, and without any equivocation, that infection, and, so far as he could make out, infection only, gave rise to the immune state. It was several years later before either Koch or Behring accepted this conclusion as a fact. In his modest working place at Saranac Lake, Trudeau had discovered essentially the same substance which Koch afterwards designated as tuberculin. Trudeau found that this substance would not prevent or cure tuberculosis in guinea pigs, and said so. Koch shortly afterwards made claims regarding its therapeutic virtues which, as all the profession knows, failed to be established.

Today the Adirondack Sanatorium and Institute is a centre not only of healing, but of advanced study with a world wide influence, second to no other, on the treatment of tuberculosis. Such is the heritage left to his fellow men by this brave, self-sacrificing, and hard working American physician, one of the pioneers in the advocacy of the therapeutic value of rest and an outdoor life.

GUY'S HOSPITAL *GAZETTE* BICENTENARY NUMBER

IN a previous number we called attention to the fact that this year was the bicentenary of the foundation of Guy's Hospital, and the centenary of the opening of the medical school and that a special subscription was being solicited to wipe off the debt associated with some new additions to their buildings. To emphasize the work accomplished by this very worthy charitable institution, a special number of the *Hospital Gazette* has been published to which several very

interesting papers have been contributed by members of the Hospital staff. Sir William Hale-White contributes a most interesting history of the institution; a history of the medical school by its Dean, Professor T. B. Johnston, with a description of the present hospital buildings follows. An account of the nurses' training school is given by the Lady Superintendent, in which she recounts the development of nursing in Guy's Hospital during the last two hundred years. The printing and numerous illustrations are all of high standard. Every member of the profession is indebted to the many illustrious men graduates of Guy's Hospital who have done so much to advance medical science. There are many also in Canada who feel themselves personally indebted for knowledge gained in its wards and lecture halls, and who will be glad to have a copy of this interesting number, of which the price is 2/6. It may be obtained from the Gazette Office, Guy's Hospital, London, S.E.1.

Editorial Comments

EDITORIAL COMMENT

We desire to direct attention to two unusually interesting case reports which we publish in this issue. One a case of Amaurotic Family Idiocy, reported by Dr. Thomas A. Lebbetter of Yarmouth, N. S., which occurred in the family of a fisherman of British parentage whose parents and grandparents had lived in Nova Scotia for more than two generations. Dr. Lebbetter has done wisely in referring the notes and photograph to Dr. B. Sachs of New York for confirmation of the diagnosis. Dr. Sachs writes as follows: "I thank you for giving me the privilege of seeing your article on Amaurotic Family Idiocy and I was particularly interested in the photograph of the child showing the very typical appearance of a child affected with this disease. I have looked over your article, and have no doubt regarding the diagnosis. The only thing I wish to say is that my views regarding the exclusive racial occurrence have undergone a slight change as I also have seen a few such cases. Your case is well worth reporting."

The second very interesting case which we present to our readers in this issue is a case of biliary cirrhosis in an infant of fourteen months of which Dr. Day of Winnipeg gives us the notes and a careful autopsy by Dr. William Boyd confirms the diagnosis. As Dr. Day states in his report this disease is met with most frequently in young adults, but even at this age is a rare disease in America. Dr. Day after a very careful examination of the literature has found no case reported as occurring at such an early age.

PHYSIOLOGICAL ABSTRACTS

"*Physiological abstracts*" is the title of a Journal published monthly by the Physiological Society of Great Britain and Ireland, in order to present promptly and in a concise form abstracts of papers published in journals of physiology and the allied sciences throughout the world. The work is done by about fifty abstractors, each an authority on the particular kind of original work dealt with. The abstracts are grouped into twenty-three sections. The value of this publication in enabling workers in biological and medical science to keep abreast of contemporary research is great. We hope that such a valuable quarterly will be brought within the reach of all Canadians who are interested in biology and physiology.

IMPORTANCE OF REST AND POSTURE IN FATIGUE

In a recent report of the Industrial Fatigue Research Board (British), two papers appear on the importance of posture and rest in muscular work; papers which have a theoretical interest for the profession, and a practical interest for manual workers and employers. One of the practical points insisted upon is, that if there is an opportunity for a rest pause in the course of industrial work, the posture should be changed even if the pause last only a minute as thereby the circulation through fatigued muscles is promoted and fatigue diminished. Changes of pos-

ture made during work may be even more refreshing than rest pauses. Another point of practical importance insisted upon in these papers is that if it is anyone's duty to carry a fairly heavy load then the easiest way is to divide it into two equal parts and sling it from a shoulder yoke.

It is stimulating to meet with manifestations of such vigorous life as are shown in the monthly bulletin of the Vancouver Medical Association. It contains matter that is well-chosen and bright, and that is high praise in journalism: but even if it were less attractive, it would be none the less worthy of emulation.

The statistics from the Vancouver Health Department make interesting reading, and, if the suggestion be allowed, might perhaps be made more so by the addition of figures for one or two other months, for comparison. We note particularly the rather large number of cases of smallpox, and the absence in January and February of typhoid fever.

We commence the publication in this issue of a series of papers of Industrial Toxication read at a meeting of the special committee appointed by the Ontario Medical Association to investigate the various conditions under which industrial poisoning may occur. The subject is one of great importance to employers of labour and to the profession, as well as to the employee who may suffer. The address of the chairman is published in this number. The others will follow in successive issues.

At the conclusion of the Conference two resolutions were passed:

1.—That the Directors of the Ontario Medical Association be requested to take the necessary steps to urge upon the government the advisability of adding to the schedule of industrial toxications (a) benzol poisoning, and (b) silicosis occurring in other employments than that of mining.

2.—That the same officers draw the attention of the Attorney-General to the advisability of appointing a medical referee who should express a final medical opinion on all cases of industrial poisoning and that such a referee should be one who has some special knowledge of such toxications and is competent to express an opinion upon them.

The Council of the Canadian Society for the Study of Diseases of Children have decided to hold their annual meeting in Ottawa on June 5th and 6th. It is hoped that arrangements may be made to enable the meetings to take place in the Chaudiere Golf Club at which it is hoped that a number of the members may be able to find temporary lodging. This scheme would certainly contribute greatly to the pleasure of those attending. Members are requested to send in as promptly as possible the titles of their papers to Dr. George A. Campbell, secretary-treasurer, 164 Metcalfe Street, Ottawa.

We have received a well printed pamphlet of about twelve pages which bears the title of "How some little blue noses find health," an account of a branch of the work of the Halifax-Massachusetts Health Commission. It relates the work of this most excellent Red Cross Society in restoring to health many poorly nourished children. This is a most readable pamphlet and gives an interesting account of the methods and the excellent work accomplished by this commission. In the closing paragraph the writer refers to the "undone vast," and adds that when the workers look up from their little field of endeavour and see what should and what must be done they often become discouraged. We may state for their encouragement that their work is regarded as an inspiration by Red Cross societies in other provinces of our Dominion.

"I have had three personal ideals: one to do the day's work well and not to bother about to-morrow; the second to act the Golden Rule as far as in me lay towards my professional brethren and towards the patients committed to my care;.... and the third to cultivate such a measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and be ready when the day of sorrow and grief came to meet it with courage befitting a man."—Osler.

XUM

Men and Books

THE FIRST MEDICAL SCHOOL IN CANADA*

Its History and Founders, with Some Personal Reminiscences

Francis J. Shepherd, M.D.

Montreal

This being the centenary of the founding of the first Canadian medical school I thought it a fitting opportunity of saying something about the origin of the school and the men who founded it.

The Royal Institution for the Advancement of Learning was established by provincial statute in 1802. The intention was to found two non-sectarian universities, one in Quebec and one in Montreal, to be endowed with Crown lands.

In 1811 James McGill made his will leaving his estate of Burnside and £10,000 to found a college in the future Montreal University.

In 1813 he died. His trustees were: Hon. J. Richardson, James Reid, James Dunlop and the Rev. John Strachan. To the last named it is said we are indebted for the McGill donation as it was his inspiration that influenced James McGill.

In 1818 the board of the Royal Institution for the Advancement of Learning was nominated and consisted altogether of English speaking citizens; the French refused to have anything whatever to do with it, though many were nominated especially among the higher clergy.

In 1821 a Royal Charter was granted to the Royal Institution for the Advancement of Learning, and to McGill University by His Majesty George IV. In this connection eighty non-sectarian schools were formed and were the beginning of the present system. As these schools excited no popular sympathy and were not supported, they dwindled away till all that was left was the name of the Royal Institution for the Advancement of Learning. There was a principal, Bishop Mountain of Quebec, a professor of classics who lived in the townships, a professor of medicine who lived in Quebec, and a board, but no students and no buildings. Afterwards the normal school and the high school of the McGill College were formed and affiliated with the university. There was much litigation before the bequest of McGill was handed over to the Royal Institution. The estate of forty-eight acres did not come into their possession until 1829, and the money bequest until much later, and then chiefly owing to the exertions of Dr. J. Stephenson, who acted as secretary to the Institution.

Montreal General Hospital.—In this same year, 1821, the present central building of the Montreal General Hospital was commenced and the foundation stone laid with great ceremony, participated in by the military, citizens and Masons. There had been, in 1819, a hospital of twenty-four beds in Craig Street, near St. Lawrence Street. This new building was the supreme effort of the English speaking citizens; it cost £5,856.8.02. It was opened in May, 1822, with 100 beds, quite a large hospital for a city of less than 20,000 inhabitants. Its first officers were: President, Hon. Mr. Richardson; Vice President, Reverend John Bethune; Secretary, Alexander Skakel, and Treasurer, Samuel Gerard, afterwards president of the Bank of Montreal. The medical staff consisted of Drs. Holmes, Stephenson, Robertson and Caldwell, also Drs. Loedel and Lyons. The first four were Edinburgh men. The charter was not obtained from the legislature until 1823 and with much difficulty as it was strongly opposed, especially by one member, Mr. O'Sullivan, notwithstanding the eloquent advocacy of the Hon. John Molson. It was opposed by Mr. O'Sullivan because the reasons given in applying for a charter were: (1) the treatment of the sick poor, (2) the advancement of medical science, and (3) the teaching of medical students. Mr. O'Sullivan said that an addition to the Hotel Dieu Hospital would fill all needs, and that instead of having hirelings as nurses they would be nursed by women devoted to the service of God, and that as for advancing medical science they would only experiment on the patients and allow ignorant students to treat them, etc. Dr. Caldwell wrote to the *Courant* a pretty strong letter to which he did not sign his name. Mr. O'Sullivan said in the House, if the writer of the letter would declare himself he would call him out. Next day Dr. Caldwell wrote under his own name a still stronger letter and was consequently called out by the legislator. They exchanged five shots. O'Sulli-

*Read before the Montreal Medico-Chirurgical Society, Dec. 5th, 1924.

van was shot through the chest and Caldwell had his arm shattered. In those days they fought with pistols carrying an ounce bullet. Mr. O'Sullivan after a prolonged and critical illness recovered, as did Dr. Caldwell, who had been an army surgeon in the 13th Dragoons and had been through the Peninsular War. The following year the charter was granted.

No sooner was the hospital in good running order than the medical staff determined to start a medical school, and on October 20th, 1822, the expediency of starting one was brought up at the meeting of the Medical Board, and Drs. Holmes and Stephenson were appointed a committee to inquire into the matter. On the 27th, the subjoined resolutions were adopted:

"The medical officers of the Montreal General Hospital having seen the great difficulties which the student in medicine in Canada has to encounter before he can acquire a competent knowledge of his profession, knowing the inconvenience resulting to many from the necessity at present existing of spending several years in a foreign country to complete a regular medical education, and being convinced of the advantages which would result from the establishment of a medical school in this country, have met to consider the possibility of founding such an institution in this city. After due deliberation they conceive that the following considerations warranted an endeavour to promote so desirable an object.

"1st. There can be but one opinion concerning the utility and necessity of a school of medicine in this province seeing that the condition of medicine in many parts sufficiently attests the want of opportunities of medical instruction. Such an institution will tend very much to remove the growing evil by the facility it will afford of acquiring medical knowledge.

"2nd. There can be little doubt that students from different parts of this province as well as from Upper Canada, and probably from the adjoining States, would eagerly profit by the opportunities afforded of acquiring a sound medical education. Those who might not intend to pursue their studies at a foreign university would be enabled to obtain an adequate knowledge of the useful branches of medicine, while those who after attending this institution might wish to enjoy the advantages in other countries, would be better able to benefit by them.

"3rd. They consider that the Montreal General Hospital is an institution which much favours the establishment of a school of medicine in this city. It affords the student á facility of acquiring a practical knowledge of physic never before enjoyed in this province; an advantage which will be greatly enhanced by the establishment of lectures on the different branches of the profession.

"4th. If such a plan should be carried into effect, a pecuniary benefit would result to the funds of the hospital highly advantageous in their present state.

"5th. They are further encouraged to attempt the formation of a medical seminary, when they reflect that the medical school of Edinburgh, the basis of which they would adopt for the present institution, now justly considered the first in Europe, is of comparatively recent formation, it being little more than 100 years since medical lectures were first delivered in that city. The early history of the Edinburgh Infirmary is not dissimilar to that of the General Hospital.

"6th. In the event of the establishment of a classical and philosophical seminary in this city the two institutions would be materially benefitted.

"7th. Should such a desirable object be attained the following gentlemen on furtherance thereof have agreed to deliver lectures in the several branches of the profession: *Anatomy and Physiology*, Dr. Stephenson; *Chemistry and Pharmacy*, Dr. Holmes; *Midwifery and Diseases of Women*, Dr. Robertson; *Materia Medica*, Dr. Loedel; *Botany*, Dr. Holmes; *Surgery*, Dr. Stephenson; *Practice of Physic*, Dr. Caldwell."

These resolutions were submitted to the Governor-General, Lord Dalhousie, at Quebec and approved by him. He said he willingly gave his support to so desirable an object and would do all in his power to assist the medical gentlemen who have come forward in so liberal a manner; the school to be called the Montreal Medical Institute.

On February 4th, 1823, the first public announcement was made of the delivery of lectures on medical subjects by the above named medical men, but it was not until the autumn of 1824 that the courses of lectures and clinics were commenced with a class of twenty-five students. Thus it was that the first medical school was established in Canada in connection with the first hospital which furnished clinical facilities of the same character as did the European institutions. The school was called the Montreal Medical Institute, and was more or less at that time a private enterprise. It was founded as to its organization and methods of teaching on the

Edinburgh school which in its turn received its inspiration from Leyden. There was much similarity between the two schools and also between the Edinburgh Infirmary and the Montreal General Hospital.

In 1828 the authorities of the Royal Institution for the Advancement of Learning made advances to the Medical School and requested that they become the Faculty of Medicine of McGill College, for according to the will of James McGill, teaching had to be commenced in ten years from the time they acquired his property. The Burnside estate had been in their possession since 1819, and although they did not get the £10,000 until some years later, owing to litigation with the Des Rivieres family, it was essential that teaching should commence in 1829. After some formalities the Montreal Medical Institute became the Faculty of Medicine of McGill College, but one lecturer only had the rank of professor, Dr. Andrew Fernando Holmes. Thus again was the resemblance to Edinburgh continued, for in 1720 the *extra mural* medical school became the Faculty of Medicine of Edinburgh University. I must say something about the founders of the school whose foresight, energy, perseverance and great ability enabled them to carry through a scheme which at that time was a great undertaking and which encountered many difficulties and much opposition. Drs. Holmes and Stephenson were both graduates of Edinburgh University. Drs. Robertson and Caldwell were retired army surgeons also educated at Edinburgh. The former was a Scotchman from Perthshire, son of James Robertson of Kendrochet; he was educated in Edinburgh, and joined the 49th regiment as assistant surgeon, and immediately went to Cape Breton. Later he became surgeon of the 41st Foot and fought in the war of 1812-1814. Caldwell, also a Scotchman, born in Ayrshire in 1782, graduated in medicine at Edinburgh, and was surgeon to the 13th Dragoons, served during the Peninsular War on Lord Aylmer's staff, and after the peace came to this country and soon gained a good practice. Stephenson was the only born Canadian, and came of a family who held a good position, his father being a merchant in this city; the family had been in Canada since the year after the Conquest. He was graduated at the Collége de Montréal.

Holmes was born in Cadiz, Spain, and should have been born in Canada had not chance prevented it. His family were coming out to Canada in the latter part of the eighteenth century when the ship on which they sailed was captured by a privateer and brought as a prize into Cadiz. They were detained there several years, and there Andrew Fernando Holmes was born (hence his name Fernando); he was four years old when he arrived in Canada; he was practically a Canadian as he was educated here at Dr. Alexander Skakel's school. In 1813 Holmes and Stephenson went together to study medicine in Edinburgh and graduated from that university in 1819. They visited London, Dublin and Paris and returned to Canada together and established themselves in practice entering into partnership with their former preceptor, Dr. Arnoldi. Drs. Robertson and Caldwell having retired from the army were also established in Montreal and these four men were the ones who were chiefly instrumental in stimulating the rich merchants of Montreal to provide funds for the establishment of a general hospital. Loedel, mentioned in the list, never lectured and retired from the school in the first year.

Up to the foundation of this school licenses to practise were given by a board of army medical officers appointed by the Governor-General. Now Lord Dalhousie made these four lecturers also examiners for the license so that their students after being taught by them were also licensed to practise; a great privilege indeed. The French doctors formed a French school some years afterwards which was at first a keen competitor of the English school, but the great clinical advantages of the Montreal General Hospital soon proved which school gave the best education and the competition died down.

In 1833 Dr. Caldwell died of typhus fever which was then a yearly scourge. He was replaced by Dr. Racey, of Quebec, an Edinburgh graduate, who only remained two years. His place in turn was taken by Dr. George W. Campbell who had recently come out from Scotland. He was a graduate in arts and medicine of Glasgow University. Campbell was a great source of strength and was an outstanding man both in the community and the profession. He was afterwards dean for twenty-two years. In 1833 the first degree was conferred, the recipient being William Logie who graduated in medicine after a four years' course.

During the political troubles of 1837-1838 the school suspended its functions for two sessions, but resumed again in 1839. It was not until 1844 that the number of students reached fifty. It is well to have on record that from its inception the

school required four sessions of six months each as in Edinburgh; one year's apprenticeship with a doctor counted as one year. In the neighbouring states all the schools graduated men in two sessions of four months each, and in no hospital in the States at that time were the students given the freedom of the wards. The Montreal General Hospital was for many years the only clinical hospital on this continent.

Dr. John Stephenson died in 1842, and there was now a rearrangement of the chairs as follows: Dr. A. F. Holmes, Practice of Physic; Dr. Archibald Hall, Chemistry; Dr. M. McCulloch, Midwifery; Dr. G. W. Campbell, Surgery; Dr. O. T. Bruneau, Anatomy; Dr. Colin Sewell, Physiology and Materia Medica. The first home of the Medical Institute was on Place d'Armes near the site of the present Bank of Montreal. The school faced Place d'Armes and backed on Fortification Lane which was much lower, and here was the dissecting room. When the school joined McGill it moved further down Great St. James Street. In 1841 it moved to St. George Street on the west side three doors above Craig Street; the building is still there.

University Lying-in Hospital.—In November, 1843, the wives of the professors of the McGill Medical Faculty started a lying-in hospital for the relief of the poor of Montreal, and the teaching of medical students in the important branch of midwifery. The hospital was situated on St. Urbain Street, below Dorchester, on the east side. It was an unpretentious building but served its purpose well for the time.

In 1844 Dr. Robertson died, and in 1845 Dr. Robert MacDonnell, a relative of Graves of Dublin was brought from Dublin as Professor of Physiology and Pathology (Institute of Medicine). MacDonnell being fresh from the source, brought out all the new teaching of physiology and pathology, and also used the microscope. Again there was a rearrangement of chairs, the new appointments being as follows: Dr. Robert MacDonnell, Institute of Medicine; Dr. Crawford (retired army surgeon), Clinical Medicine and Surgery; Dr. William Fraser (of Glasgow), Medical Jurisprudence; Dr. William Scott, Demonstrator of Anatomy; Dr. Papineau, Botany.

In 1845-1846 the Central Building (now the Arts) of McGill was built with the money obtained by the exertions of Dr. Stephenson, then secretary of the University, from the Des Rivieres family. So the medical classes were held in this building and here also was situated the dissecting room, on the distinct assurance that the "effluvium" therefrom should not disturb the deliberations of the Governors of the University who had their meeting place next door. This building at that time was somewhat out of town and in winter after a storm was difficult to get at.

In 1849, clinical medicine and clinical surgery were separated, Dr. Crawford taking clinical medicine and Dr. R. MacDonnell taking clinical surgery. In 1850 Dr. MacDonnell went to Toronto to accept a professorship in Toronto University, but not finding affairs suitable to his desires he came back to Montreal and finding his place filled in the college, he, with Dr. David started the St. Lawrence School of Medicine in association with some very energetic young doctors then growing up. They had a hospital on Guy Street; the building still exists; it was first a Baptist college, then a hospital, and now a nunnery (it is a large imposing building with great square stone pillars in front). The moving spirits were Drs. Robert MacDonnell and David, and amongst the lecturers were R. Palmer Howard, George E. Fenwick, and William Sutherland, all afterwards prominent professors in McGill. In 1851 the *Canada Medical Journal* made its appearance edited by Drs. MacDonnell and David. Their medical school was down town and much more convenient for students. McGill was losing students. So much was this so that Drs. George W. Campbell, McCulloch and Sutherland (who had been taken into McGill as lecturer in chemistry) built a brick building, No. 15 Cote Street, and next door to the Theatre Royal which was recently pulled down. This building they rented to the College for £100 a year, the rental never to be increased. This convenient site was not far from the hospital, and this fact, associated with the absorption of several of the more active members of the opposition school revived the invalid school, and the St. Lawrence school passed out of existence. Its hospital was absorbed by the Hotel Dieu and is now the St. Patrick's ward there. This building on Cote Street was used for teaching purposes by the faculty from 1851 to 1872, and I received most of my medical education there.

In 1852 all the lecturers were made professors; previously the only professor had been Dr. Holmes who now became the first Dean of the Faculty.

When the school of the Faculty of Medicine of McGill University removed to the new building on Cote Street it had a class of sixty-four students.

XUM

It is interesting to compare the number of medical students in the two provinces, Upper and Lower Canada, and in the various schools at that date:

Upper Canada	*Students*
University of Toronto	45
Toronto School of Medicine	31
Trinity College	12
Total	88

Lower Canada	*Students*
McGill University	64
St. Lawrence School	24
Ecole de Med. et Chir	24
Quebec	16
Total	128

About this time, 1855, Dr. William Dawson was appointed principal, chiefly through the influence of Sir Edmund Head, the Governor. Dr. Dawson was a Nova Scotian, a graduate in Arts of Edinburgh, and when appointed held the position of superintendent of education in Nova Scotia. He was already well known as a geologist, having been a protegé of the late Sir William Logan. He was a great stimulus to the university. He revived the Faculties of Arts, Law and Engineering for Medicine previously had been practically the only faculty of the university. He brought new life with him and persuaded the rich merchants and others to endow chairs, found scholarships, and build buildings. He was indefatigable in forwarding the interests of the university, and both on the platform and elsewhere preached the importance of giving money for higher education. It was due to his efforts that the Molson Hall and Library, the Redpath Museum and afterwards the Redpath Library were built. Sir William Macdonald was induced to build and endow the chemistry building, the physics building and the engineering building; part of the money for the latter was furnished by Mr. Thomas Workman. Many minor gifts too numerous to mention we owe to him. The Victoria College for Women was the gift of Lord Strathcona then Sir Donald Smith. Sir William Dawson was a power for good in the community and was much respected. He never asked for anything he did not get.

Most of these were men of ability, energy, and devoted to their profession. In 1866-1867 the number of students had risen to 184. In the Coté Street building there were only two laboratories, *viz.*, the dissecting room and the hospital. The latter was the strong point of the school, and its reputation for teaching bedside surgery and medicine was far spread. It was chiefly this reputation which brought William Osler to the school a year later. On entering the old Coté Street building the museum was on the right side of the passage and the library on the left. At the end of the passage was a large lecture room. Upstairs the whole front was the dissecting room, and there was another large lecture room in the rear. This was the whole equipment—two lecture rooms, dissecting room, museum and library. Lectures commenced at nine o'clock in the morning; chemistry, the last one, was given from seven to eight in the evening. At eight o'clock we entered the dissecting room and worked until ten or half past. Most of the work in practical anatomy was done at night though the room was open all day for those who chose to work. There was no apparatus in the building except what was needed for the few lectures given on physics, or natural philosophy as it was then called. We had no microscopes and all I learnt in microscopy was during the course on physiology. Dr. Fraser brought his house surgeon, Dr. Roddick, down to the college, and we all took turns in the library looking at the circulation of the blood in the frog's foot. Anatomy was not systematically taught in the dissecting room though the demonstrator Dr. Fuller was a good anatomist, and was the first to make frozen sections and dissections, and have them cast in plaster and then painted. Some of them are still in the anatomical museum of the McGill Medical Faculty. In chemistry we had good lectures and fine experiments from Dr. Craik, but no practical work, though Dr. Girdwood at this time gave a private extra-mural course in his laboratory two flights up in a house on St. James Street. There was no physiological laboratory, and there were no lectures on hygiene. In the hospital, post mortems were performed by the house surgeons, Drs. Ross and Roddick, until Dr. Osler was appointed. The bedside teaching in medicine was good as were Dr. R. P. Howard's lectures which were always up to date and given with great enthusiasm and illustrated by pathological specimens. As a clinical teacher he was unsurpassed. The surgery bedside clinics were instructive, especially in fractures and ulcers. The operating room was of course pre-antiseptic and the man

who looked after the operating room and instruments was also the post mortem attendant. Operations were chiefly ligature of arteries, amputations, cutting for stone, and removal of tumours. Occasionally we saw a case of strangulated hernia operated on, but at that date opening of the abdomen was usually fatal. The operating table as well as the old frock coat of the operator was stained with the blood of many victims. The operators were skilful and rapid having been educated mostly in pre-anæsthetic days. I have seen an amputation of the thigh completed in less than one minute. We had not then such good results in amputations as in the time of Ambroise Paré for the stumps were closed with wire sutures and without drainage with the long ends of the ligatures hanging out of one corner of the flap, and the patient either died of sepsis or secondary hæmorrhage. In Paré's time the stump was cauterized with a hot disc of metal and kept open so there were no pent up discharges. In compound fractures of the leg the only salvation was immediate amputation. But all this was changed in 1877 when Dr. Roddick came out from Scotland with a full equipment of Listerian dressings and the carbolic solutions for instruments and field of operation, and last but not least the steam carbolic spray producers. But I must not say too much about these conditions which have been so often written about.

In 1871 the need for new buildings and laboratories was felt and the Governors were persuaded to build on the college grounds, near the university entrance, a new medical school at a cost of $28,000. The old building in Coté Street was sold and in 1872 we moved to our own college building where the Biological building now is.

The new building was very commodious compared to the old one in Coté Street, but it was roughly finished the walls being all plain brick with no plaster. The library was well furnished by the dean, Dr. George W. Campbell, and the museum was much improved and more spacious, as was the dissecting room. At this time there were only 154 students, a decrease of thirty from ten years before. The year we entered the new building in the college grounds Dr. Fraser died (58). He lectured on institutes of medicine. He had no laboratory and all his knowledge was book knowledge. He was a Scotchman from Glasgow and his accent was Doric. We called him "Old Commoonicate." His text book was Todd & Bowman's *Physiology*, and the last edition was 1857. He quoted freely from Bidder & Schmidt and wrote innumerable tables of analysis on the blackboard which we religiously copied in our notebooks. The last week of the course was devoted to pathology, chiefly inflammation. He was succeeded by Dr. Joseph Morley Drake, the professor of clinical medicine, not because he knew more physiology than the rest of his colleagues but because it was a more lucrative chair and a promotion. He resigned next year (1874) because his work was too laborious and not compatible with a large practice. Dr. Osler, who had just returned from Europe, succeeded him and things then began to move.

In 1875 I returned from abroad having been appointed demonstrator of anatomy whilst in Vienna. I also stirred things up and I hope reformed or rather instituted the method of teaching anatomy which I had learned in London and Vienna. In this year Dr. George W. Campbell resigned from the chair of surgery, and his place was taken by Dr. George E. Fenwick.

In 1877 Osler collected sufficient funds to form a physiological laboratory and also to equip it. George Ross was professor of clinical medicine, and Thomas Roddick of clinical surgery, both able, active, energetic and good teachers. Ross was the most acute diagnostician I have ever known and a very able clinical teacher from whom Osler learned much. The school now had four young enthusiastic teachers who livened up the affairs of the college and were rather looked on with suspicion by the old conservatives.

In the '70's the medical school in connection with Bishop's College, Lennoxville, was established in Montreal and all the younger men who were ambitious and were eager to teach, and had no McGill appointment, joined. There were also older men such as Drs. Godfrey, Francis W. Campbell, Trenholme, and others who furnished the sinews of war. This school induced a healthy rivalry with McGill and some of the best men were in training for future work at the older school. Men such as William Gardner, George Wilkins, George E. Armstrong and others in time received McGill appointments and became afterwards prominent members of the Faculty of McGill. Rival schools tend to stimulate teachers and are of great benefit in encouraging initiative and enthusiasm and in bringing out the best that is in men. Until the establishment of the Western Hospital the Bishop students took the McGill clinics at the General Hospital. The Bishop's Medical School was the first to educate women for the practice of medicine in the Province

of Quebec, and Dr. Maude Abbott, curator of the McGill Medical Museum, who has acquired a world wide reputation for her work on the anomalies of the heart, and as an organizer of and worker for our Museums, is a graduate of Bishop's College.

In 1878 the age of specialism began, for Dr. Frank Buller who had been for five years in charge of Moorfields Eye Hospital in London, was induced by Osler and myself to come out as oculist and aurist to the General Hospital. He also treated diseases of the throat and nose. It was quite a revolution, though the attending surgeons did not at once give up their right to operate on the eye, ear and throat.

On the occasion of the fiftieth session of the Medical Faculty of McGill University a "semi-centennial celebration" was held. Although the school was founded in 1824, still, it only became the Faculty of Medicine of McGill University in 1829. Then two sessions were missed during the Rebellion of 1837-1838-1839—so this year was the fiftieth session of the McGill Medical Faculty. This celebration was marked by a convocation for conferring honorary degrees and an address was delivered by the dean, Dr. R. Palmer Howard, giving a history of the faculty and its founders as well as a sketch of the late dean, Dr. George W. Campbell, who had died of pneumonia on the 30th of May in Edinburgh whilst on a trip to Scotland.

On October 5th, 1882, the Faculty gave a large dinner at the Windsor to the old graduates and invited guests. At this dinner it was announced by Dr. Howard that an anonymous friend had given $50,000 as a memorial to the late Dr. George W. Campbell on condition the citizens raised a similar amount before the 1st of August next. The dinner was attended by the Lieutenant-Governor of the Province, Dr. Robitaille, a graduate in Medicine, Dr. Workman of Toronto, a graduate of 1835, the sixth I believe, and many prominent citizens, also the principal, Sir William Dawson. Many speeches were made and in every way the dinner was a great success.

In 1883 Dr. William Gardner was appointed gynæcologist to the General Hospital (another invasion of the rights of the physicians and surgeons) and professor of gynæcology in the university. Dr. George Major was appointed laryngologist to the hospital and afterwards professor of laryngology in the university. Dr. Blackader was appointed as lecturer in pædiatrics. Eighteen eighty-three was a memorable year, for owing to deaths and resignations many changes were made, much deadwood thrown overboard and the younger and more advanced men came into their inheritance. Dr. Scott, professor of anatomy, died and I replaced him. Rev. Dr. William Wright resigned as well as Dr. MacCallum, the former from the chair of materia medica and the latter from that of midwifery and diseases of women. Dr. Wright was replaced by Dr. James Stewart of Brucefield, Ont., a graduate of 1869 who had made a reputation by his papers on therapeutics. Dr. Arthur Browne, of Montreal, occupied the chair of midwifery. He was the most active obstetrician in Montreal at that time, but only held the chair for two or three years finding the work too heavy with his large practice. He was succeeded by J. Chalmers Cameron. Dr. Richard MacDonnell became demonstrator of anatomy and assistant physician in the General Hospital. Our dean, after holding the office for twenty-two years had died in Edinburgh in 1882 of pneumonia, and was succeeded in this office by Dr. R. Palmer Howard, with Dr. Ross as subdean. Dr. Wilkins became professor of medical jurisprudence. In that year also I became full surgeon in the General Hospital and gave the summer clinics.

In 1884 the visit of the British Association for the Advancement of Science gave much encouragement to our teachers especially those in the primary subjects, and brought them in contact with many prominent British members of the profession. In this year also we had the great misfortune to lose Dr. Osler who accepted a call to Philadelphia as professor of clinical medicine.

I have now to record a series of misfortunes which befell the faculty. In 1889 our dean and professor of medicine, Dr. Howard, whom we all revered and who was such a strength to the faculty and a man respected and admired by all, died of pneumonia. In 1891 Dr. Richard MacDonnell our able and popular professor of clinical medicine died of tuberculosis at the early age of thirty-seven. In 1891 Dr. George Ross who had taken Dr. Howard's place as professor of medicine and who had proved one of the best clinicians our hospital had produced, died also at the early age of forty-seven. These three deaths so close together weakened considerably our department of medicine, but we closed up our ranks and new men were promoted and it was not long before this department recovered its strength. Dr. James Stewart became professor of medicine and clinical medicine and Drs. Finley and Lafleur became

lecturers in medicine and clinical medicine. In 1892 Dr. Adami from Cambridge, England, joined the faculty as professor of pathology. Wyatt Johnson became lecturer in bacteriology and afterwards in medico-legal pathology. Dr. George Armstrong became instructor in surgery in 1892, James Bell professor of clinical surgery, and Dr. Blackader became professor of pharmacology and therapeutics but still retained his position as lecturer in pædiatrics to which he had been appointed in 1883.

In 1894 the session was extended to nine months and in the following year the remodelled old buildings and new portions were opened by the Governor-General, Lord Aberdeen, with addresses by Dr. Osler, Sir William Dawson and others. It was a great function. It was then announced that Sir Donald Smith had endowed the chairs of pathology and hygiene each with $50,000. It had been a source of great anxiety to the faculty how to enlarge our accommodation when Mr. John H. Molson came forward with a gift of $60,000, and this with money added from the faculties' funds gave us sufficient money to commence the work of extension.

In 1901-1902 there were 440 students and the need for further accommodation became again urgent. New laboratories were greatly needed. Our old and liberal friend, Lord Strathcona, again came to our assistance with a gift of $100,000. This, with a supplement from the faculty's funds enabled us to build new laboratories and gave us increased space in every part; the old building was remodelled and new buildings added. There was a beautiful central hall entirely of wood, pillars, galleries, etc., but unfortunately anything but fireproof. These buildings were opened on September 19th, 1901, by T. R. H. the Duke and Duchess of York, the present King and Queen of England. It was a great function and Their Royal Highnesses received honorary LL.D's on this occasion. The new laboratories for zoology, histology, pharmacology, pathology and bacteriology were quite up to date and gave ample room for expansion.

On April 15th, 1907, these new buildings and part of the original ones were burned down, the fire originating in the new part where so much wood was. It was thought that some one carelessly throwing down a lighted cigarette at a late committee meeting started the fire. It began about two a.m. and in a couple of hours the destruction was completed. The lead floor in the dissecting room saved the library below and part of the museum. My anatomical museum, the work of thirty years, was destroyed and with it went many treasures in books and plates and anatomical notes in my own private room. It was happily at the end of the session and although it was a great blow to the school, good came of it. We repaired the ruined buildings temporarily and by the aid of our benefactor, Lord Strathcona, were enabled to build the present school on Pine Avenue and to repair the old school sufficiently to be a very useful adjunct. Lord Strathcona's gift was most lavish—in the neighbourhood of $600,000. Fortunately the wing containing the teaching laboratories and the chief lecture room of the faculty were saved and this wing was sufficiently restored in time for the opening of the session 1907-1908, and the work of the faculty was not seriously interfered with though we were somewhat crowded.

In 1911 the new buildings were formally opened by their Excellencies Earl and Countess Grey and afterwards a brilliant evening reception followed. The opening of the new buildings was preceded by two days' celebration in honour of a reunion of graduates. A large dinner concluded the festivities at which the Governor-General Earl Grey was present.

The rest of the history of McGill is so recent that the majority of you are well acquainted with it so that I need not further trespass on your time for I know I have been necessarily tedious, but I wished to emphasize the gradual development of the school and the great things it has achieved.

Sir Auckland Geddes, President of the Society for the Prevention of Venereal Disease, will head a joint deputation of the National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Disease which the Minister of Health has consented to receive on March 3rd. The object of the deputation is to urge the Minister of Health to give effect to the recommendation of Lord Trevethin's Committee "that the law should be altered so as to permit properly qualified chemists to sell *ad hoc* disinfectants provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority."—*Brit. Med. Jour.*

Correspondence

ON THE RELEASE OF CODEIN AND DIONIN FROM THE LIST OF SCHEDULED NARCOTICS

To the Editor:

Since the receipt of the circulars of the Department of Health No. 8-A of February 23rd, 1923, No. 12-A of the 10th January, 1924, and No. 13-A of September 4th, 1924, in which attention is drawn to the provisions of "An Act to Prohibit the Improper Use of Opium and Other Drugs, 13-14 George V, 13th June, 1923," it is evident that members of the medical profession have been considerably inconvenienced and annoyed by the fact that they have to give a written order for every narcotic or narcotic preparation even though same may be urgently required, and there may be no time to give the signed order according to law, as telephoning and telegraphing is forbidden.

The pharmacists as a body are very anxious to follow the instructions of the doctor, but the law provides a penalty of not more than $1,000, and not less than $200, or a prison term not exceeding eighteen months, or both fine and imprisonment, if such a fully signed order be not duly handed to the pharmacist before the drug is sent out. When the druggist declares that he is unable to send the narcotic in response to a telephone call or telegram where no signed order is provided, the doctor is naturally indignant. The pharmacist, between the law and its penalties and the doctor whom he desires to serve, is in an awkward dilemma.

In response to appeals from the drug trade for relief, the Government officials state that they are bound to administer the law, and have no alternative but to enforce the provisions of the Act in all cases. Furthermore, they say that the Federal Government is not in a position to initiate any alteration in the present Federal Act, as the Drug Acts of most of the provinces have scheduled opium and its salts, including such drugs as codein, apomorphine and dionin, and therefore it would be impossible for the Federal Government to amend its Act and withdraw the restrictions now imposed upon the doctor, the pharmacist, the manufacturer and the wholesaler, unless such provincial amendments had been made which would provide for the modification of the present Act, or the withdrawal of certain articles from the list of prohibited drugs.

We are informed that at a recent meeting of the Opium Commission under the League of Nations, it was decided that it was permissible that the following might be withdrawn from the list of prohibited drugs:

Codein—Apomorphine—Dionin

We understand that this step was taken because many members of the medical profession are of opinion that codein cannot be rightly classified as a habit-forming drug, and therefore its withdrawal from the list of prohibited articles would not be detrimental to the public well-being. Apomorphine and dionin—especially the latter—did not appear to be regarded as in the same category as codein; a section of the medical profession regarding them as akin to the heroin group, and therefore more knowledge is required of their habit-forming tendency or otherwise.

Examination of the various requisitions received for narcotic preparations establishes the fact that a very large proportion indeed contain codein, which, under the present regulations, calls for the production of a signed order, registration, etc. If codein be eliminated from the schedule it would mean a marked relief to the doctor, pharmacist, wholesaler and all concerned in the handling of the products. It would therefore appear that it is in the interests of all concerned that codein at least should be omitted from this list of registerable narcotics, and that some action should be taken to this end.

The Opium Commission under the League of Nations is international in the scope of its operations. Practically every civilized country has signed the narcotic agreement. It follows that the legislation is international and applies with equal force to all signatory countries, and while there are slight variations between the different regulations, they are practically the same.

In the hope that the Opium Commission would permit the elimination of the articles named from the list of narcotics requiring signed orders, registration, etc., and believing that the Federal Government would not be averse to such action, it would appear that any representation in favour of the change from the medical profession would be regarded with favour and would hasten the much desired change in the law.

Yours truly,

Theo. H. Wardleworth.

National Drug and Chemical Company of Canada Limited, Montreal, *March 2nd, 1925.*

Abstracts from Current Literature

MEDICINE

Primary Carcinoma of the Lungs. Fried, B. M. *Archives of Internal Medicine*, January, 1925.

The author reports in detail ten cases of primary carcinoma of the lungs. In a review of the literature, he believes that the increased attention to carcinoma in general, and to lung tumours in particular, is responsible for the increase in the last decade in the reports concerning this condition.

As regards histogenesis there are three elements in the lungs which may give rise to primary carcinoma: (1) the epithelium lining the bronchial mucosa; (2) the mucous glands, and (3) the epithelium lining the alveoli.

In a study of the etiology, one writer affirms that "there is no primary lung cancer without a previous chronic inflammation." The chief etiologic factor, however, is unknown. Tuberculosis as a chronic inflammation, may account for the origin of a carcinoma leading to a metaplasia of the epithelium (wall of cavity, scar of a healed lesion) which is ultimately transformed into malignancy. Recent investigations suggest also an etiologic relationship between acute inflammation of the lungs (epidemic influenza) and malignancy.

The occurrence of metastases in primary lung carcinoma has been reported by many observers. In 374 cases reported by Adler, 280 gave metastases. In order of frequency the regional lymph nodes, liver, pleura and lungs occupy first place, while the brain and bones are very much less frequent. In all but four of the author's cases, however, there were metastases in the brain and bones. In one instance the tumour involved the medullary portion of the vertebra without producing any changes in the outline of the bone. In two instances, the brain and the bones were involved; in one the bones and the fifth nerve, and in another the brain and leptomeninges. He regards metastases as occurring early, and from his cases finds that these metastases may mask the whole clinical picture. Because of this property, the clinical picture may be divided into two groups—typical, with the chief complaint concerning the chest organs, and atypical, with symptoms due to metastatic involvement. The author considers the diagnosis of the atypical cases often impossible. Of twenty-nine cases reported by Cottin, Kramer, and Salox, a correct diagnosis was made in only 20 per cent.

As regards the typical cases he considers that the diagnosis can usually be made. The onset is as a rule gradual. The auscultatory signs are scant, and not characteristic. A sharp, stabbing pain in the chest, due to an early involvement of the pleura, is one of the most characteristic signs. No other disease, and especially tuberculosis, will give such a persistent pain with failure to respond to treatment. In three of the author's cases pain in the chest was the earliest sign and chief complaint of the patient. Cachexia is practically always present. The duration of the disease is practically the same as in carcinoma anywhere in the body. In the author's cases the duration varied from three months to about sixteen months. Primary carcinoma of the lungs is more than twice as common in men as in women.

As far as laboratory examination is concerned, repeated negative sputum for tubercle bacilli, in the presence of persistent lung symptoms, especially when associated with a gradual downward course, always suggests malignancy. The exudate is in the majority of cases, bloody. It contains not infrequently tumour cells and the importance of a histological examination of the effusion is outlined by all writers.

From Roentgen-ray examination certain writers have arrived at the following conclusions:

1.—The areas of increased density found in primary pulmonary carcinoma are usually quite typical, and can be differentiated from areas of increased density caused by other diseases in the thorax.

2.—The nature of the new growth may be diagnosed before the appearance of clinical symptoms.

L. C. MONTGOMERY

PÆDIATRICS

Cervical Ribs in Children. Southam and Bythell, *Brit. Med. Jour.*, Nov. 8, 1924.

Little attention has been directed to cervical ribs as a cause of symptoms in childhood. Indeed cervical ribs are usually discovered accidentally in children, as they seldom cause trouble until adult life is reached. In thirteen cases mentioned in this article twelve were bilateral and ten occurred in girls. In five of the cases the clinical diagnosis of cervical caries had been made and three others were associated with torticollis. In many instances the diagnosis can only be made by x-rays and in most of these the cervical ribs can not be definitely established on palpation, though occasionally two hard masses may be felt above the clavicle. Pressure symptoms are also occasionally met with, such as pain in the arm and wasting of the small muscles in the hand. The majority of cervical ribs are only partly ossified at birth and are not revealed by x-rays until later in life. It will be remembered that ossification and growth of the dorsal ribs are not completed until the twenty-fifth year. No doubt cervical ribs develop in a similar manner, and this would account for the lack of symptoms in childhood as it is natural to suppose that the increase in growth and size of the rib may lead to greater pressure on the nerve trunks.

In many cases of cervical ribs no treatment is necessary. In others treatment to develop the muscles supporting the shoulder girdle may be sufficient, but if not removal of the offending rib is indicated. L. M. LINDSAY.

SURGERY

Report on Blood Transfusion Work Seen in the Hospital for Sick Children, Toronto, Canada. Cross, G. K., *Brit. Jour. of Chil. Dis.*, July-September, 1924.

In the wards of the Hospital for Sick Children, Toronto, where the material for the report was seen, five hundred and sixteen transfusions were performed in twelve months. The author presents the technique and indications for simple transfusions which are performed by the syringe method, using whole blood—or by the more common citrate method. The results quoted are very good. The technique of exsanguination transfusion as introduced by the late Dr. Bruce Robertson is described. The results of the treatment of severe burns in childhood, erysipelas and food intoxications in babies, by this method, are excellent. The principle is that partially exsanguination of the septicæmic or intoxicated infants removes part of the infection or toxin, then washing through fresh whole blood and finally giving a small simple transfusion, renews the resistance.

The use of intraperitoneal injections of citrated blood is spoken of. The best results according to this author are obtained by injections of 20 cc. twice daily. These intraperitoneal injections do not tend to cause adhesions as shown by post mortems. This form of transfusion has several advantages, simplicity, no necessity for cross-agglutination, and is particularly suitable for the treatment of the simple anæmias of infancy, due to malnutrition, rickets or syphilis. Charts are appended showing the effects of exsanguination transfusions on the temperature curve of toxic infants; and of intraperitoneal transfusions on malnourished babies. R. R. STRUTHERS

The Significance of Craniotabes and Bowing of the legs. Barenberg, L. H. and Bloomberg, M. W., *Amer. Jour. Dis. of Chil.*, December, 1924.

These authors examined both clinically and radiographically a large series of infants for the accepted signs of rickets and also made estimations of the inorganic phosphorus of the blood. They believe that the significance of craniotabes in rickets is still undecided. They are of the opinion that softening of the skull under the age of four months is generally not the result of rickets, and is an unreliable diagnostic sign at this early period. After this age craniotabes is intimately associated with rickets and is a sign of diagnostic value.

In the same series of infants bowing of the legs was observed in fourteen instances where there were no clinical, roentgenological or chemical evidences of rickets. R. R. STRUTHERS

Acute Serous Encephalitis. A Newly Recognized Disease of Children. Brown, C. L. and Symmers, D., *Amer. Jour. Dis. of Chil.*, February, 1925.

This article consists of the case reports of

ten patients, five seen in Boston and five in New York, suffering from maladies analogous clinically and pathologically, and representing, these authors believe, a newly recognized disease of children. The incidence was equal in the sexes, ages from twenty-two months to seven years, average twenty-eight months. The condition is of rapid onset with irritability, anorexia, vomiting, and diarrhœa, sore throat and fever even to 105°, and signs referable to derangement of the central nervous system, among them bulbar signs in the form of respiratory irregularities, ptosis, strabismus, nystagmus, papilledema, retraction of the angle of the mouth, muscular twitchings, rigidity of the neck or jaw, hemiplegia, coma, convulsions, and death within thirty-six hours to a few days. The cases are separable into two clinical groups, one in which convulsions are associated with one or several of the localizing signs which have just been enumerated; in the second group no such signs are present and the only obvious symptom of derangement of the nervous system is to be found in the convulsions, which are not controllable by the usual therapeutic measures.

Anatomically the disease shows a bulging, wet brain with intense engorgement of the pia. Microscopically there is hyperemia and œdema of the pia, engorgement of the blood vessels of the brain, perivascular and pericellular œdema. Every capillary in the brain is crowded with red blood corpuscles, but hæmorrhages into the brain substance are rare. The perivascular cellular infiltration characteristic of poliomyelitis and epidemic encephalitis was not seen in any of the sections, but rather the blood vessels were crowded with cells and the serum had escaped into the perivascular tissues producing the œdema. R. R. STRUTHERS

Lumbo-Sacral Backache.—Verrall, P. Jenner, *Brit. Med. Jour.*, Nov. 1, 1924.

The writer first discusses briefly the occurrence of severe bone and joint diseases, such as caries and non-tuberculous arthritis. The importance of x-rays in making a diagnosis is noted. Gonorrhœal infection is responsible for some 65 per cent of severe cases of spinal arthritis, and quite 30 per cent are due to metastatic infection from the intestinal tract (dysentery, typhoid and *B. Coli*). Treatment includes rest, support and in subacute cases fixation by a Taylor brace.

Traumatic.—Crush fractures of the vertebral bodies are much commoner than is usually thought. Deformity may gradually follow the accident, the bone yielding as it softens. Rest and complete fixation for three to four months are indicated, while the prognosis is good as regards union. Subsequent pain will be due to vertebral distortion or to adhesions either in the joints themselves or around the exits of the spinal nerves.

Such adhesions are not always preventable, but much may be done by instituting exercises at the proper moment. In old standing cases, where the skiagram shows firm union, it is quite correct treatment to break down adhesions by mobilization under a general anæsthetic (not gas) and to follow this up with active exercises. In back injuries where the skiagram is negative one diagnoses *sprain*, of which the treatment is at first rest and fixation. After the acute symptoms have passed off local massage and graduated exercises are indicated at the earliest date consistent with safety. If in spite of this treatment pain persists, mobilization of the spine is indicated followed the next day by exercises; this manipulation should be thoroughly carried out to the full degree of motion under a general anæsthetic. Such treatment is useful also in cases of railway spine when the lawsuit has been settled, combined with the cautery or the brisk use of a scrubbing brush on the spine, with the assurance of cure.

Mechanical.—Under this head the writer refers to the work of Sherrington and Bankart and points out that the contraction of muscles is of two kinds, (1) phasic, concerned with movement, and (2) postural, with the maintenance of posture. It is thought that these two functions have a separate nerve supply, and that the maintenance of posture is controlled by the sympathetic, ultimate control coming from the paracerebellar nuclei and the semicircular canals. Posture is thus normally maintained mechanically and without fatigue, but when the balance is upset and voluntary muscular action called in to assist, fatigue and pain quickly follow. Neurasthenia, adenoids, eye strain and excessive mental exercises commonly interfere with the mechanical maintenance of posture by the sympathetic, and as a result

there is an additional strain thrown on the voluntary muscle, with fatigue and pain. Thus in many cases of backache the muscles are quite normal but the nerve control is weak, and a search for the cause, whether toxic or mechanical will frequently enable us to cure it.

The writer points out the effect on the back of pregnancy and enteroptosis. Voluntary muscular effort when fatigued will be succeeded by increased pull on the ligaments, with resulting backache. A short leg, a knock-knee or a flat foot all have this influence in the production of abnormal spinal strain and consequently backache. Sacro-iliac strain is discussed, and the outstanding cause given as childbirth with its marked ligamentous relaxation.

In cases of tuberculosis of this joint a new operative fixation is described by the writer, who runs a long graft from side to side through both posterior superior spines, the graft resting on a prepared bed in the sacrum under the erector spinæ muscles. In the rare cases of sacralization of the fifth lumbar with impinging of the transverse process against the ilium the advice is given to cut a window in the iliac crest to relieve the strain and remove the impinging process.

Referred Pain.—It is here pointed out that the sympathetic controls postural activity and also the tone of the hollow viscera. The same nerves also contain the sensory nerves of the viscera. Hence a visceral lesion may express itself in pain along the course of the spinal nerves, as both come from the same ganglion on the posterior nerve root. Uterine displacement thus gives referred sacral pain, renal disease may cause pain to radiate along the twelfth dorsal nerve, and an overloaded colon may cause pain, not only by its weight, but by reference along the upper two lumbar nerves.

J. A. NUTTER

Discussion on Post-Operative Pulmonary Embolism. Lockhart-Mummery, P., *Brit. Med. Jour.*, Nov. 8, 1924.

The writer points out that most of the so-called post-operative pneumonias are in reality pulmonary embolism. About one in ten cases of pulmonary embolism terminates fatally. The incidence of this condition is about one in every thousand of cases operated upon. The onset is sudden with pain and dyspnœa without any premonitory signs or symptoms. Fever develops later, whereas in pneumonia, fever is present before the onset of pneumonia, and dyspnœa is a comparatively late symptom.

Cases of pulmonary embolism are divided into three categories:

1.—Cases in which death occurs instantaneously and without premonitory symptoms.

2.—Cases in which death occurs in a few minutes or hours following an acute and sudden crisis characterized by dyspnœa and pain in the chest.

3.—Cases in which the patient, after a similar crisis, develops signs of consolidation of part of the lung and recovers.

The first type of case the writer thinks is the result of a detached clot reaching the medulla of the brain rather than the result of a clot blocking the pulmonary artery.

The degree of symptoms depends upon the area of lung involved. If the thrombus lodges in one of the smaller branches of the artery dyspnœa is only temporary and soon passes off. If the thrombus lodges in the main artery dyspnœa is extreme and it is due to the strain on the heart as a result of the sudden limitation of the area of pulmonary circulation and not to the limitation of ventilation surface, a fact which must be remembered in treating the condition. Amyl nitrate or morphine can be given with much better results than oxygen or stimulants which one sees so often administered.

Obviously pulmonary embolism is a secondary condition, so the important thing to determine is the formation of the primary intravascular clot. This is discussed at considerable length and the conclusions drawn are, that the clot is usually situated either in the internal or external iliac or at their angle of union to form the inferior vena cava, and that the cause of the formation of the clot is stagnation of the blood stream, as the result of faulty pre-operative preparation of the patient, unnatural posturing on the operating table, or where the circulation is poor anyway as is found in anæmias and chronic toxæmias.

In the author's own words: "The best method of preventing patients from getting post-operative thromboses does not consist in altering the technique of operations, but rather in altering the methods of preparation and of

after treatment. Preliminary purgation of the patient should be abolished. The practice of starving the patient both before and after operation should be discontinued. The supply of proper mattresses on the tops of operating tables and the prevention of the patient assuming a constrained position during the operation which would cause pressure upon the veins, are points requiring great attention. The frequency of embolism after gynæcological and gall bladder operations is possibly attributable to the unnatural positions in which the patients are placed. I think we should attach more importance to the comfort of the patient on the operating table than we do at present.

ALBERT ROSS

A Comparison of Sodium Tetrabromphenolphthalein with Sodium Tetraiodophenolphthalein in Gall Gladder Radiography. Whitaker, L. R. and Milliken, G., *Surg. Gyn. and Obst.*, January, 1925.

The authors point out that the elements are opaque to x-rays approximately in proportion to their atomic weights. Hence the relative opacity of the iodine salt to the bromine salt is approximately 2 to 1. Graham and Cole considered the iodine salt to be too toxic for human use. The writers conducted a series of experiments on rabbits, cats, dogs and guinea pigs but could find no appreciable difference in the toxicity of the two salts. Three and a half grams of sodium tetraiodophenolphthalein dissolved in 50 cc. of water to which 1.5 cc. of 10 per cent sodium carbonate had been added, was then injected into a human subject. Much less severe reaction was experienced than that obtained with a previous injection of 5.5 grams of the bromine salt. The alkali is necessary in order to keep the salt in solution. Much denser shadows were obtained with the iodine salt. The dose of the iodine salt does not require to be so large in order to obtain a very definite shadow.

G. A. FLEET

The Surgical Treatment of Cancer. Judd, E. Starr, *Jour. Am. Med. Assoc.*, Jan. 3, 1925.

Whether the lesion is of the so-called precancerous type or whether it is cancerous from the beginning, the early eradication of the lesion brings about a cure.

The so-called pre-malignant diseases are discussed. Leukoplakia is sometimes a pre-malignant condition. There is a probability that benign ulcers of the stomach do become malignant. The author believes that all gastric ulcers should be treated surgically by removal as thoroughly as possible. Chronic mastitis and other conditions in the breast may be a result of rather than a cause of cancer. Chronic mastitis should not always be treated surgically but every solitary lump in the breast or any unusual nodule in association with a diffuse mastitis should be excised immediately for microscopic diagnosis.

Early treatment of erosions of the cervix uteri is important. Epitheliomata sometimes develop in intractable ulcers of the skin. Polypi in the colon have a tendency to become malignant. Cancer of the sigmoid is often associated with diverticulitis.

Usually cancer originates as a solitary focus. Occasionally it seems to occur in several places simultaneously. Probably these follow an unrecognized primary lesion. The importance of propaganda is emphasized as an aid to the early securing of cases. Any sore that does not heal, any lump or tumour or the passing of blood from anus, urethra or vagina may mean malignancy. Bladder tumours are frequently unrecognized. Many cases of rectal carcinoma are treated for hæmorrhoids.

Even with early operation the results in some cases are disappointing; on the other hand, many seemingly inoperable cases have resulted in cures. Broder's gradation of malignancy, according to cell differentiation, is of assistance in making a prognosis and prevents operating on certain cases where treatment would be of no avail. Broder's classification is as follows: Three-fourths of epithelium differentiated and one-fourth undifferentiated is classed as Grade 1. When the differentiated and undifferentiated epithelium is about equal it is Grade 2. Undifferentiated three-fourths Grade 3. If there is no tendency to cell differentiation it is Grade 4. The number of mitotic figures are also important to assist in grading. The more malignant a tumour the more undifferentiated or embryonic its cells.

The author considers that even palliative operations should not be performed on patients whose condition can be shown to be hopeless and the growth cannot be removed.

L. H. MCKIM

XUM

Diathermy in the Removal and Treatment of Pharyngeal Cancer. McKenzie, D., *Jour. Lar. and Otol.*, October, 1924.

The author has used diathermy in the treatment of pharyngeal cancer during the past ten years. He thinks that in its treatment no other remedy so far tried can equal it. It has a two-fold action upon the area treated, first, a cauterizing combined with a coagulating effect by which diseased tissue can be destroyed, and second, an antiseptic effect by which the tissues in and at some distance beyond the range of its destroying powers are sterilized.

Cases are classified from the treatment point of view into:

(1) Those which can be operated on in the hope of eradication.

(2) Those in which eradication is out of the question, but an operation is done to relieve pain and to retard the progress of the disease.

The following points are considered when deciding whether efforts at total eradication should or should not be made: (1) The situation of the growth; (2) Its superficial extent; (3) Its depth of penetration; (4) The condition of the lymphatic glands.

If the cancer is operable the primary deposit is removed by diathermy and the lymphatic glands draining the diseased area are removed by ordinary dissection and diathermy.

Because of the freedom from hæmorrhage in the subsequent procedures the author prefers operating upon the neck first and ligating the external carotid. He removes the primary growth entirely by diathermy. The surface is first gone over superficially with the diathermy terminal. With the diathermy knife the growth is then encircled and the incision carried down through healthy mucosa about a quarter of an inch outside the edge of the ulcer to the muscular layer and deeper. The edge of the tissue to be removed is then seized with Waugh's tonsil grasping forceps, undercut, and removed if possible in one piece.

Finally, after the whole of the diseased tissue has been removed, the raw surface left should be methodically gone over with diathermy. The slough separates in from ten to fourteen days.

The second operation may be performed as late as three weeks after the first. Details of six cases treated are given. G. E. HODGE

A Method of Treatment in Fractures of the Long Bones. Royle, Norman D., *Med. Jour. Australia*, Aug., 1924.

Has devised a method of treating fractures of the long bones that is at once simple and effective and can be applied as well in the outlying districts as in the well equipped general hospital. He reviews briefly the results of muscular action upon a fracture, changes set up by fractures and the current methods of treatment.

His methods require a knowledge of plaster of Paris technique and aims at taking away the necessity for muscular action by fixing the joints in the normal position and by providing an exo-skeleton to support the soft tissues and to prevent side displacement. The joints above and below the site of fracture are first encased in plaster and allowed to set. When setting has taken place reduction is effected by manipulation or by traction or by both, traction being made on the end casings. The middle portion is then plastered to maintain the ends in position and to support the weight of the soft tissues. A detailed technique as applied to fractures of the tibia and fibula, the femur and humerus and the radius and ulna is clearly given. Accessory treatment is also stressed, especially active movements, and the author claims that these can be carried out at an early stage by splitting the end casings after union has become firm. The author stresses the dangers of too vigorous massage and favours the light, superficial strokings which produce muscular relaxation and vaso-constriction reflexly. If this method is followed out there is an absence of rapid wasting of the muscles which the author claims is an evidence of continuous action on the part of the muscles. The author favours a smooth, close fitting covering for the skin and recommends stockinette or some similar material with a thin layer of saddler's felt. Where swelling is feared a piece of rubber motor tube is placed next to the stockinette, the plaster split longitudinally over this. The rubber tube may be withdrawn after this has been accomplished. N. T. WILLIAMSON

Periarterial Sympathectomy. Black, Kenneth., *Brit. Med. Jour.*, August, 1924.

The author discusses briefly the theory of periarterial sympathectomy, giving credit to Claude Bernard as the instigator of the original experiments carried out in the rabbit. Le Riche, of Lyons in 1921 reports sixty-one cases of periarterial sympathectomy for the relief of various chronic lesions with only one complete failure.

The author, working on the assumption that the sympathetic vasoconstrictors extend along the arterial wall in the adventitia or outer coat, reports ten cases of leprous ulceration of the lower extremity treated successfully by decortication of about one inch of the adventitia of the femoral artery. Healing of ulcers was obtained as early as two to three weeks in some of his cases. In none of the cases were any untoward results noticed. The best results were obtained when there was an absence of much scar tissue about the ulcers.

The author's contraindications for the performance of this operation are renal, hepatic or cardiac disease or arterial degeneration.

N. T. WILLIAMSON

Blood Stream Infection Treated with mercurochrome 220 Intravenously. Piper, Ed. B., *Am. Jour. Obst. and Gyn.*, Jan., 1925, p. 17.

The author, after extensive experimental work, has decided that mercurochrome may be employed clinically in cases of proven blood stream infections. Initial dose, mercurochrome 1 per cent, 20-30 cc. intravenously, for patient of 100 lbs., increasing 5 cc. for each 30 lbs. increase body weight.

Dr. B. C. Hirst in seventeen cases of puerperal streptococcic infection, some of which were moribund or unconscious, obtained recovery in 45 per cent by the use of this drug. The author quotes several cases. The results have been remarkably encouraging; recovery has followed in streptococcic septicæmia, staphylococcic septicæmia and purulent meningitis. In addition he cites fatalities, whether from the severity of the infection, the action of the drug alone on the kidney, or the effects of both.

The method is not infallible, the drug is a dangerous agent, and its use is permissible only in the most severe cases of proven blood stream infections.

A. D. CAMPBELL

ANÆSTHESIA

Spinal Anæsthesia. Leriche, Rene, *Annals of Surgery*, Jan., 1925.

The writer's experience includes 3,000 cases of spinal anæsthesia. He uses it in seventy-five per cent of operations on parts below the level of the diaphragm. There were two deaths and three serious accidents. One death was in a case of severe shock. In the other there was advanced cachexia from stenosis of the pylorus. In both cases the blood pressure was very low. The serious accidents included a case of shock and two cases of purulent meningitis.

Failure occurred in 5 to 6 per cent of the cases and resulted either from inferior quality of the drug used or from faults in technique, such as the use of too large a needle with consequent escape of the fluid injected into the epidural space.

If the injection is given very slowly and carefully the anæsthesia may be localized to only a few dorsal nerve roots, the motor nerve roots being quite unaffected. Anæsthesia limited to the abdomen may be obtained by making the injection very gently in the mid-dorsal region. Spinal anæsthesia works best where the pressure of the cerebrospinal fluid is high. The writer occasionally injects salt solution under the spine an hour beforehand, in order to raise the pressure.

Syncope during the first half hour is not due to the anæsthetic affecting the bulb, but to bulbar anæmia and is relieved by lowering the head.

Headaches depend upon the flow of cerebrospinal fluid into the epidural space, through the hole made by the needle. Only very fine needles should be used.

W. B. HOWELL

Ascending Respiratory Paralysis under General Anæsthesia. Miller, Albert H., *J.A.M.A.*, Jan. 17, 1925.

Progressive ascending paralysis of the muscles of respiration develops as anæsthesia deepens. The part played by the thorax in breath-

ing becomes less and less until finally respiration is carried on by the diaphragm alone. In very deep anæsthesia the compensatory activity of the diaphragm causes sinking in of the chest wall during inspiration, and an exaggerated type of abdominal breathing. If now the surgeon is hampered by the movements of the abdomen there may be great danger in increasing the amount of anæsthetic given. The abdomen will become quieter with less anæsthetic.

W. B. HOWELL

The Hazard of Surgical Anæsthesia with Syphilis of the Brain. Lecount, E. R. and Singer, H. A., *J.A.M.A.*, Jan. 31, 1925.

Details of two cases of sudden death in connection with ether anæsthesia are given. One patient died three and three-quarter hours after a laparotomy, during which the round ligaments were shortened and the appendix removed. At the autopsy general meningo-encephalitis was found. In the second case death occurred ten minutes after the administration of ether was begun. Disseminated syphilitic fibrous leptomeningitis was present.

The writers consider syphilis the predisposing, and the anæsthetic and preliminary narcotic, the exciting causes of death in both patients.

If the cells of the central nervous system are saturated beyond a certain point cytolytic changes take place and recovery will not occur. The power of the nerve cell to regain its normal condition is spoken of as reversibility. The range of reversibility is lessened in syphilis.

W. B. HOWELL

The Known and the Unknown about Psoriasis. Schamberg, J. F., *J.A.M.A.*, Oct., 18th, 1924.

Psoriasis is considered from the etiological and therapeutic standpoint. In a large series, 13 per cent showed family incidence and in 5 per cent of cases the descendants of psoriasis patients developed the disease. No further light on the etiological agent is forthcoming.

The eruption follows a cycle, divided into stages of activity, of quiescence and of regression. For proper therapy these stages should be recognized. In the active stage measures aimed at inactivity are indicated.

A low protein diet, not exceeding 4 gm. nitrogen a day, receives first place, and leads to involution in practically all the author's cases. The difficulty of carrying out this drastic diet is admitted and a moderate increase of the daily protein intake might be permitted and still be beneficial.

To inactivate the disease autoserum injections and protein shock are useful. In the quiescent stage, x-ray, chrysarobin ointment and soap and water lavage are beneficial.

C. R. BOURNE

Septic Meningitis.—W. E. Dandy points out that the operative treatment of septic meningitis has gained little favour with the passing years. Despite the fact that the operative possibilities almost seem to have been exhausted, no impression has been made on the high mortality of the disease. Three types of treatment have been tried—repeated lumbar puncture, continuous drainage, and irrigations of the subarachnoid space. None of these methods has demonstrated any outstanding superiority over the results obtained when the case is untreated. Dandy advocates early continuous drainage of the cisterna magna in the treatment of meningitis in which the infecting organism is the staphylococcus or streptococcus. Three out of four cases so treated survived. This method is not urged in other forms of meningitis because it is felt that the character of the inflammatory exudate would probably make drainage impossible. A mid-line incision is made over the occiput and a circular area of bone removed. The dura is opened and a small catheter fixed into the cisterna magna. Drainage is remarkably effective, and no noticeable effect followed the continuous loss of cerebrospinal fluid. The author points out that drainage alone cannot cure meningitis; the body must also be able to combat the infection. It is not to be expected, therefore, that any operative method will do more than reduce the present high mortality rate.—*Surg., Gynecol. and Obstet.*, December, 1924, p. 761.

Medical Societies

THE RELATION OF BOVINE AND HUMAN TUBERCULOSIS

On February ninth there was a meeting of the Sections of Epidemiology, Comparative Medicine and Diseases of Children of the Royal Society of Medicine. It was first pointed out that scientific medical opinion was not as yet in complete accord as to the part played by tuberculosis of bovine origin in the production and dissemination of the human disease. Some estimated a large annual mortality from tuberculosis of bovine origin, with additional numbers of cases crippled by glandular enlargements, etc. Some experienced observers, on the other hand, held that the invasion by the bovine bacillus produced enough immunity to protect very many from acute tuberculosis of human origin. Dr. Robertson of Birmingham described the methods followed in that city for the combating of the disease. There was the testing of samples of milk for tubercle bacilli and the destruction of animals reported as positive. Another plan was to offer the farmer a free testing of his herd, if they would agree to eliminate those giving a reaction. Thirdly, pasteurization had been instituted. There had been a reduction in the percentage of churns showing the presence of living bacilli in the last eighteen years, and many cows had been eliminated as a result of the testing. He recommended the pasteurization and bottling of the milk, in view of the great success achieved by this method in America, and he hoped that in a few years no milk would be supplied in the raw state except from tested herds.

Lieut.-Col. Brittlebank pointed out that there was an associated economic problem of great importance seeing that it was upon agriculture that the cost would largely fall. In round numbers, there were in Great Britain seven and a half million head of stock, three million being cows and heifers. On the average, one-third of these were tuberculous in some degree, as ascertained by the tuberculin test.

He had found in the city of Manchester that about ten per cent of the samples of milk examined in the past twenty-three years had caused tuberculosis experimentally, and the proportion of farmers sending tuberculous milk into the city was higher in 1923 than in 1901. He believed that as a general rule the public would continue to buy the milk which was cheapest. It was to be remembered that the animals which earliest reacted to tuberculin gave the largest quantities of milk, that is, they were worked the hardest. He hoped for the reintroduction of the Tuberculosis Order and its amendment to allow for the inspection of every dairy farm in the country, without waiting for notification of disease. Far from giving compensation for the destruction of infected cattle, he would have it regarded as a crime for any man to have such animals on his farm.

Prof. S. L. Cummins agreed that it was to be borne in mind that where there was an absence of tuberculous cattle the human type of infection in that region was of an acute and grave character: this could be seen in large tracts of Africa and in India. The conclusion to be drawn was that the elimination of bovine tuberculosis might have disadvantages, and retrogressive farmers might use this argument to support their attitude. Such facts, therefore, required close examination and most careful explanation before being given to the public.

He believed that the mixing of milk helped in the dilution of the number of bacilli which might be present. It was said, for instance, that 25 per cent of the samples of London milk contained some tubercle bacilli, and therefore the safety of the milk as a whole must have been greatly increased by mixing.

Dr. Niven spoke of the more successful control of the milk supply in America, and the value of the free use of ice in that country, an aid not so easily obtained in Britain. The Astor Committee had put forward a programme which he hoped would be adopted by the Ministry of Agriculture. He asked whether it would not be possible to have some such system of grading the milk coming into the city as existed in New York.

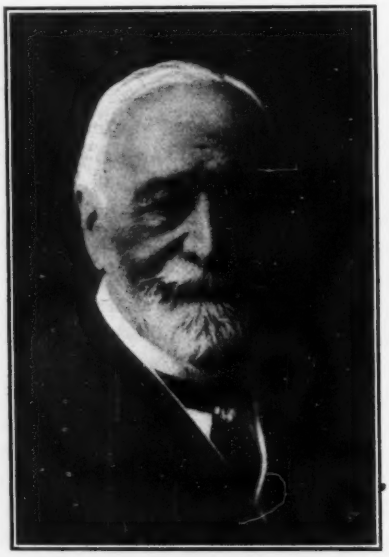
H. E. MacDermot

Obituaries

THE RIGHT HON. SIR THOMAS CLIFFORD ALLBUTT, P.C., K.C.B., F.R.S.

It seems the irony of fate that in our last issue Sir Clifford Allbutt's career was alluded to in an obituary notice of Sir James Mackenzie. Now we learn with profound regret that the veteran of British medicine died from heart disease on February 22nd. His period of dyspnœic suffering was brief; fortunately, only a few minutes.

Sir Clifford Allbutt was born in 1836 at Dewsbury in Yorkshire, and educated at St. Peter's School, York. In 1857 he entered Gonville and Caius College, Cambridge, as a scholar and graduated in the first class of the Natural Science Tripos. He studied at St. George's Hospital, London, and took his degrees at Cambridge of M.B. in 1861 and M.D. in 1869. After holding house appointments, he commenced practice in Leeds, where he shortly received the appointment among others of physician to the Leeds General Infirmary. His practice was enormous, but despite the great physical exertion it required, he found opportunity to keep abreast of the times acquainting himself with everything of value to be found in medical literature and, indeed, adding to it from his ever-increasing store of clinical experience. In 1867 he invented the present short form of clinical thermometer to replace the cumbrous one then in use. For years he worked patiently studying eye grounds with the ophthalmoscope, collecting and interpreting data, and in 1871 he gathered his various papers on the subject together into one volume entitled, *The Use of the Ophthalmoscope in Medicine*. In it was given a very sane and rational view of the use of the instrument in the diseases of the nervous system and of the kidneys. To him we owe the term "choked disk."



THE RIGHT HON. SIR THOMAS CLIFFORD ALLBUTT, P.C., K.C.B., F.R.S.

Allbutt was elected a Fellow of the Royal Society in 1880 and in 1883 of the Royal College of Physicians. Although never president of the College of Physicians he was a member of its Council 1906-1907. In 1894 he gave the Goulstonian Lectures on *Visceral Neuroses*. In 1900 he delivered the Harveian Oration, on *Science and Mediaeval Thought*, and in 1909 the Fitzpatrick Lectures on *The Story of Greek Medicine in Rome*. In these lectures as well as in those delivered in St. Louis, U.S.A. on *The Historical Relations of Medicine and Surgery*, (published 1905) Allbutt showed himself a finished classical scholar. He was not an antiquarian pure and simple and did not love old things simply because they were old, but he took pleasure in studying the great movements of history and the rise and fall of the different schools of thought.

Sir Clifford Allbutt left Leeds in 1889 to become Commissioner in Lunacy, refusing many tempting offers of various kinds in London. After three years in his new position he was elected Regius Professor of Physic at Cambridge as successor to Sir George Paget. He was also appointed physician to Addenbrooke's Hospital. He remained in Cambridge pursuing his busy professional and academic life until the time of his death. He read widely—indeed it is surprising how much time he found to read—in medicine and general literature. Not one of the least functions of the Regius Professors of Medicine at Oxford and Cambridge is to criticize and assess the value of many theses and much new work. Every few weeks in the *British Medical Journal* or *Lancet* would appear a letter from Sir Clifford Allbutt on some matter that he deemed of interest. In the *Lancet* of February 28th in which an obituary notice appears of him, there is published from his pen a letter recounting the effect of alkalis upon eczema in one of his patients.

Sir Clifford Allbutt's most important medical work was his *System of Medicine* in eight volumes (1896-1899, while many leading authorities wrote the articles for it, he contributed to each volume and edited the whole. A second edition was published between 1905 and 1912, and in this Sir Humphrey Rolleston lightened his task by accepting the position of associate-editor. Another important and well known work of his later years was his *Diseases of the Arteries and Angina Pectoris* (1915) in two volumes. Except for his earlier work on ophthalmoscopy Allbutt will be chiefly remembered for his description of senile plethora or "Hyperpiesis" in which there may be found irregular and indefinite variations in health in people beyond middle life, associated with persistent elevation of the arterial pressure. This condition may not be accompanied by renal disease. Allbutt discussed this subject at the meeting of the British Medical Association in Toronto in 1906. He also, both in his book and in numerous letters, pressed strongly the view that angina pectoris has its origin in disease of the aorta, and not necessarily in disease of the coronary arteries. He was the first, or one of the first, to describe syphilitic disease of the cerebral arteries (1868) and in 1869 insisted upon the value of morphine in cardiac disease; in 1871 he pointed out the uses of the stomach pump. To him also, the profession is indebted for the introduction of the sphygmomanometer into ordinary practice.

Sir Clifford Allbutt received honorary degrees too numerous to mention. He was created K.C.B. in 1907, and was made a Privy Councillor of Great Britain in 1920. He did yeoman service for the British Medical Association for fifty-five years. At Aberdeen in 1914 he was appointed president-elect which position he held until 1916 when a few days after his eightieth birthday he was elected with acclamation president of the Associa-

tion and was re-elected year after year until 1921. In public addresses as long ago as 1882 and again in 1888 Allbutt emphasized the importance of comparative pathology and the study of diseased conditions not only in man but in animals and even plants. He did not plead in vain, although he had to appeal for many years, for an institute of comparative pathology has been founded at Cambridge, and when the Section of Comparative Medicine in the Royal Society of Medicine was formed a couple of years ago he was elected as its first president.

The funeral service was held in the Chapel of Gonville and Caius College; the College of John Caius, Harvey, and Glisson, and as is the custom all those present gathered in the "court" while the body rested under the Gate of Honour. Surely no one exemplified better than he the characteristics of those students of that college who have passed successively through its three gate-ways: of Humility, of Virtue, and of Honour. He was buried in Trumpington Churchyard, near Cambridge.

In 1869 Sir Clifford Allbutt married Susan, daughter of the late Thomas England of Headingly. They had no children but to Lady Allbutt who survives him, the sympathy of the whole medical profession goes out.

Perhaps a personal reminiscence will not be out of place. While staying with the Master of Christ's College in the autumn of 1915, Dr. Adami took me to lunch with Sir Clifford and Lady Allbutt at their house, St. Radegund's, on the outskirts of the town. They were both very much amused at a jocular message to their cook which I carried from the "Brother Regius" at Oxford. After lunch we went into the library and it was a great treat to see Sir Clifford's countless books and papers ranged in shelves about the room and to be shown how he did his literary work. This he has outlined in that admirable book *Notes on the Composition of Scientific Papers* (3rd edition 1923). I remember that he and Dr. Adami discussed the place of the classics in education and how Sir Clifford told of an attempt at a boys' school in Cambridge to make Latin a living tongue by insisting that the pupils should converse in that language. Sir Clifford's dignified face and figure made a lasting impression upon me on that occasion.

After Sir William Osler's arrival in England their friendship became a very warm and intimate one. Sir Clifford was not slow to appreciate and be amused by the playful jokes of his junior at the rival university. As representing the senior University of Oxford Sir William Osler was entitled to enter the room at official receptions before Sir Clifford Allbutt who represented the University of Cambridge, but Osler would have none of this, and insisted that they should be announced as "the Regii" and taking Allbutt by the arm they walked into the room together.

Although I had written to Sir Clifford Allbutt several times in the interval and he had shown me great kindness when I was working upon some notes of Duchenne of Boulogne, I did not see him again until that memorable occasion at the house of the Royal Society of Medicine, London, on the afternoon of July 11th, 1919, when he presented to Sir William Osler on behalf of the latter's students and co-workers the two volumes of *Contributions to Medical and Biological Research*. Sir Clifford Allbutt's address was brief but many of those present doubted whether they had ever heard a more touching or beautiful one. On the day of Sir William Osler's funeral he came to Oxford and though stricken with grief at the loss of his dear friend he showed greater courage than many a younger man would do. One could see that he would continue his busy life of medical and literary work and the round of many committee meetings to the very end.

He came to St. Bartholomew's Hospital in 1920 soon after the establishment of the medical professorial unit there, and it was a joy to see how enquiring his mind still was. He asked questions about everything and afterwards gave a short clinic to the clerks on a case of heart disease in the medical out-patient department. I remember his pointing out the difference in the site of the pain in myocarditis and in angina pectoris. It is perhaps interesting to remark that he pronounced it angina not angïna, preferring to adhere to the Greek. In 1909 (I think at the annual meeting of the British Medical Association) Sir William Osler in a discussion on angina pectoris said he could not agree with his "Brother Regius" in this matter of pronunciation.

The last time I saw Sir Clifford Allbutt was on a cold foggy evening in March, 1922, at the West London Hospital where he had come to lecture at the Post-Graduate College on the subject of angina pectoris. It was with some pride, I am sure, although he was the last man to show it, that he told us that his view upon the cause of the disease was received favourably by some of the leading authorities in Europe and in America. He compared the aorta to a "pressure tambour" as it was so rich in sensory end organs. He stated that the disease in his opinion was an aortic and not a cardiac one.

I bade him good-bye at the door inwardly pitying him as he started on his long, cold drive to Liverpool Street Station before he took the train for Cambridge; and wondering how many of us of this generation would be "carrying on" at his age of eighty-six.

ARCHIBALD MALLOCH

Sir Anderson Critchett, K.C.V.O. died in a nursing home in London on February the 9th. Sir Anderson Critchett was surgeon-oculist to the king since 1901, and the acknowledged doyen of ophthalmic surgeons in England. His father before him occupied a similar position, and was a pioneer in the rapid development which took place in opthalmology after Helmholtz' invention of the ophthalmoscope. Elected at a comparatively early age to the staff of St. Mary's Hospital, he was associated with such well known men as Broadbent, Edmund Owen, and Malcolm Morris and others, all of whom added lustre to St. Mary's school. Few men have begun so early in life to practise in Harley Street, and have carried on work so long, so unintermittingly and so successfully. Although he both taught and wrote, his chief reputation arose from his technical skill and his charming personality. His steadiness of nerve and dexterity of touch permitted him to carry out delicate operations on the eye even in his eightieth year. He was elected as president of the ophthalmic section of the Royal Society of Medicine in 1912, and president of the same section in the International Congress of Medicine in 1913. Although devoted to the practical side of his profession he was greatly esteemed by all his colleagues for sincerity and uprightness of character, and loyalty to his confrères. Few men in recent times have had a larger circle of intimate friends. As a member of the Garrick Club he enjoyed the friendship of the Kendalls, and later on of Irving, Tree, and Wyndham. Indeed it may be said there were few actors or actresses of these recent times who have not enjoyed his hospitality at Harley Street. Critchett was blessed, as a writer in the *Times* expresses it, with "Equanimitas," what Antoninus Pius, one of the best and wisest of rulers, summed up as the philosophy of life. Sir Anderson was regarded as one of the old school. In his later years he was noted for his cheerfulness and good humour, loyalty to his profession, and his devotion to his patients, many of whom were treated without any fee. "Write me as one that loved his fellow men" would certainly be his wish, could it now be expressed.

Dr. Edward Emannuel Klein, M.D., F.R.S., noted for his work in histology and bacteriology, died at his residence in Hove on February 7th at the age of eighty. Dr. Klein was one of the earlier pioneers in normal histology as revealed by modern methods and

modern instruments. He was also one of the founders of bacteriology, a science which not only revolutionized the theory of medicine but placed it upon the sure basis of experiment. He was born in Vienna where he received all his early education. In 1869 Professor Stricker, was in want of someone to arrange terms for the translation of his book "Manual of Human and Comparative Histology" into English for publication by the new Sydenham Society and for this purpose chose Dr. Edward Emannuel Klein, his most talented *privat dozent*, and sent him over to London with letters of introduction to Huxley, Burden Sanderson, Turner, Thudicum, and John Simon. Although he could speak little English his friendliness and good looks soon made him welcome and enabled him to complete promptly the arrangement for the translation and publication of Stricker's work. He returned shortly afterwards to Vienna, but was invited back to London by Sir John Simon, then medical officer of the Privy Council and afterwards chief medical officer to the local Government Board, to undertake histological and pathological research for the government. His methods were regarded as so original and the results obtained so important that he was elected a Fellow of the Royal Society in 1875. In the previous year he had been appointed lecturer on histology at St. Bartholomew's Hospital. He wrote many papers on histology and bacteriology and the results of his investigations were formulated in 1884, when he published his book *Microorganisms in Disease; an Introduction to the Study of Specific Microorganisms.* He resigned from the teaching of histology in 1902, when he received the appointment of Lecturer on advanced Bacteriology at St. Bartholomew's Hospital; at the same time his researches for the government were still continued. The etiology of the oriental plague was a subject which occupied much of his attention. He leaves behind a son, Bernard Klein, M. D. Oxon, and a daughter, Miss Celia Klein.

Dr. J. E. Brouse, of Vancouver, died in that city February 17th, at the age of fifty-seven years. Born in British Columbia where he spent most of his school days, he afterwards took the trip round the Horn, and spent some time in Brockville, Ontario. Later on, he entered McGill University in the Faculty of Medicine, graduating with the class of 1892. In the following year he again returned to Vancouver. For some years he had charge of the medical work connected with the construction of the Kalso-Slocan railway. After its construction was finished he opened a hospital in New Denver, and had a large and extensive practice all through that section of the country. Not only was he coroner of the district but for many years he took a prominent part in all its public affairs. So highly was he regarded that he was several times asked to accept the nomination and become the representative of the constituency in the provincial parliament. In 1913 he left the district and made a tour of the east. Returning to McGill he spent some months attending the hospitals in Montreal, and taking a post-graduate course in dermatology, and on resuming practice settled in Vancouver as a specialist in that department of medicine. Shortly afterwards he received the appointment of dermatologist to the General Hospital in Vancouver. He is survived by his wife, and by his son, Dr. Ivan Brouse, of Powell River, B. C.

Dr. M. F. R. Irwin, one of Winnipeg's leading physicians and a prominent Mason, died suddenly at three o'clock this morning following a paralytic stroke. He was forty-nine years of age. Death came suddenly. Dr. Irwin was in his usual good health Thursday, and at eleven o'clock last night night paid a call to a patient, returning home afterwards.

Dr. Irwin came to Winnipeg in the early '80's with his parents who had previously lived in Toronto. He attended school here and graduated from Manitoba Medical College in 1905. For two years he practised at Hartney, Manitoba, making many friends there, but in 1909 he returned to Winnipeg and soon acquired a large practice. Besides his wife, his mother and one daughter survive him.

Dr. Samuel James Mellow died at Port Perry on March the 4th.

Dr. W. A. Mearns, of Hanover, Ontario, a former warden of Grey County died in the Toronto General Hospital on February the 15th at the age of sixty-six years. Dr. Mearns graduated from Trinity in 1881 and had been actively engaged in general practice for many years. In addition to his medical activities he had been keenly interested in politics, and had contested the seat in his district in both the Federal and Provincial contests.

Dr. James Mann, one of the outstanding figures in eastern Ontario for the last fifty-three years died at Renfrew on March the 9th. Born at Pakenham in 1848, he graduated from Queen's twenty-one years later, and after post-graduate work in New York began practice in Renfrew as the only physician in that district.

Dr. David Lowrey, for many years associated with the Imperial Life Assurance Company, died in Toronto at the age of seventy-eight years. Dr. Lowrey was a graduate of Trinity, and had practiced for some years in Kincardine before moving to Toronto.

Dr. John McDonald, whose death occurred on the twenty-sixth of February at St. Peter's, N. S., where he had practised for more than forty-five years, graduated at the old Halifax Medical College in 1876. He was a splendid type of the country practitioner, who gave no thought to his own comfort or convenience, but consistently "went about doing good." As a kindly, thoughtful and successful physician, and a an upright and considerate friend of everyone, he was greatly beloved throughout the large constituency which he served faithfully for many years. The funeral service at the Presbyterian church, of which he was an elder, was attended by a great number of mourners who crowded the edifice. Death was due to pneumonia. Dr. McDonald was in his seventy-first year.

Dr. Howard Douglas Wilson, of Barrington, N. S., died at his home on the 5th of March, at the age of seventy-two years. Shortly after graduating at the University of Pennsylvania in 1878, he took up practice in Barrington where his father, Dr. J. K. Wilson, had long been established, and quickly gained the confidence and esteem of a large clientele. A few years ago he was seriously injured in a motor accident, after which he was obliged to restrict his work mainly to office practice. In December last he was obliged to relinquish all work. Dr. Wilson's sympathetic disposition and tireless devotion to his patients won for him an exceedingly warm place in the hearts of the people of Barrington and the surrounding districts. A son, Mr. A. M. Wilson, is a member of this year's graduating class in medicine at Dalhousie University.

Judge J. Alfred Desy died at his home on March 16th. The deceased was president of the Anti-Tuberculosis League of Three Rivers, and vice- president of the Canadian Anti-Tuberculosis Association for the Province of Quebec.

Dr. Joseph L'Esperance died at his home, 997 St. Denis Street, on February 28th, after a long illness at the age of sixty-two years. After his graduation from the University of Laval he continued his studies for some time in Paris. On returning to Canada he settled in Montreal where he soon secured an important practice which he has carried on for the past thirty-six years.

Association Notes

ANNUAL MEETING AT REGINA, JUNE 22ND TO JUNE 26TH, 1925

The following statements are received from the Secretary of the Publicity Committee in Regina. The following Societies will hold their Annual Meeting in Regina at the same date as the Canadian Medical Association: The Saskatchewan Medical Association, the Canadian Radiological Association and the Western Branch of the British Medical Association. Opportunity will also be provided during this week for graduates of the various Canadian universities to meet separately for a few hours of social intercourse on some day during the convention.

Among those who have promised to be present and deliver addresses are: Mr. H. W. Carson, F.R.C.S., of London, England. Mr. Carson is President of the Hunterian Society; Senior Surgeon of the Prince of Wales General Hospital; Lecturer on Abdominal Surgery, North East London Post-Graduate College, and editor of a recently published "System of Modern Operative Surgery" which appears in two volumes and is spoken of very highly. Mr. Fraser the well-known Edinburgh surgeon is also endeavouring to make arrangements to be present. Dr. Picini, of Chicago, has promised to give an address on Physio-therapy; and Dr. Pritchard, of Battle Creek, will read a paper on some phases of tuberculosis with special reference to x-ray findings.

Other arrangements for the meeting are progressing satisfactorily. The palatial Parliament Buildings and grounds, among the finest in Canada, have been placed at the disposal of the Committee. All the city Clubs will be open to the visitors: The Assiniboia Club, the Wascana Country Club, the Regina Golf Club; each with eighteen hole courses. A gymkhana by the Royal Canadian Mounted Police is also promised, in which the best riders of this famous force will take part. There will be daily luncheons with prominent speakers, banquets, garden parties, drives, etc. Many inquiries with regard to accommodation have been received and it is desirable that all those who propose attending will send in their names as promptly as possible. Inquiries may be addressed to Dr. M. R. Bow, General Hospital, Regina, and will receive prompt attention.

The matter of periodic health examinations has been engaging the attention of the Association and members of the Executive Committee for some little time. The Secretary, having been instructed to study the machinery existing at the present time for periodic health examinations, has been in New York, going into the matter with two or three of the larger corporations interested in the subject. A report is being prepared which we hope to submit to our readers in the next issue of the *Journal*.

We are glad to report that the response to the drafts which have been issued to members for the annual fee, has been very gratifying indeed. Some members were away from home when the drafts were presented, while others have returned them without stating reasons. If, upon reading this item, any member recalls that he has not paid his annual fee for the year 1925, it would be appreciated if a cheque were forwarded to the offices of the Association, 184 College Street, Toronto.

After considerable delay, due to circumstances over which we had no control, the official motor emblem of the Association has been manufactured in sufficient quantity to take care of the several hundred orders which have been received. The design is a very attractive one, and we believe that the members are going to be pleased with it. The badges have been serially numbered, and a log book kept by the Association, will record ownership. The price is $2.50. Members who have not already ordered their badges, are advised that a remittance for the cost price, (plus exchange), forwarded to the General Secretary, 184 College Street, Toronto, will ensure early delivery provided the order comes in soon. Police Departments with whom this matter has been discussed, have expressed their appreciation of the action of the Association in issuing official badges. It is believed that members who use the badges will find them useful for many purposes.

Notice of Motion to amend By-laws, by Dr. A. T. Bazin

"The fee for membership in the Canadian Medical Association shall be $2.00 for the first year after graduation, $5.00 for the second year after graduation, and the full fee thereafter, except in the case of full time laboratory workers, when it shall not at any time exceed $5.00."

Medical News from the British Empire

GREAT BRITAIN

The birth rate in England and Wales is under discussion in both the newspapers and at meetings of societies of experts in statistics. As is pointed out in the *British Medical Journal* there are three indisputable facts to be reckoned with: that the birth rate has been declining for more than forty years, and is now lower than it has ever been in time of peace; that the death rate has behaved in the same way; and that the rate of natural increase is declining. It appears probable that the birth rate will continue to decline so long as the present economic conditions prevail; it is hoped that the death rate will continue to become lower.

Whether or not "birth control" is the factor responsible for the declining birth rate is a question which is being very fully debated. In some quarters, however, it is thought more important to ask, first, what is likely to happen without some great economic change; and secondly, can any remedy be found? The answer to the first question is that within, at most, two generations the population will cease to increase at all, and with the rising proportion of elderly persons, its economic power will diminish. It is pointed out that mere decrease of population may not, under existing conditions, be as advantageous as some imagine. If a given number could be selected from the present population in the proper proportions of sex, age and occupational grouping, there would be good grounds for advocating smaller numbers. But to bring about such a reduction in actual fact could only be done by (1) reducing the birth rate, and (2) allowing for the emigration of the better types and groups which alone would be acceptable to other countries; and this would inevitably be a disadvantage.

The decline of the birth rate, then, is viewed with apprehension, but the remedy therefor has yet to be found: it is a problem for "the higher statecraft."

H. E. MacDERMOT

On January 27th, the Minister of Health, Mr. Neville Chamberlain, M.P., received a deputation from the People's League of Health, who submitted to him a number of resolutions passed at the conference held at the British Empire Exhibition last May on the causes, treatment and prevention of disease. Various points were taken up by the members of the deputation. Sir Arbuthnot Lane submitted a resolution urging the appointment of a committee to prepare a pamphlet on proper food as the basis of health. Dr. Scurfield urged that the infant foods should be labelled with a clear account of their composition; he stated that preservatives were used as a substitute for cleanliness.

Professor W. E. Dixon brought out the fact that in America the presence of boracic acid in home-consumed food was forbidden, but there was no reason to infer that foods exported to this country (where there was no regulation preventing the use of boracic acid as a food preservative) did not contain boracic, which in an aggregate of small quantities was inimical to health. Sir Harry Baldwin supported the idea that the surest way to strengthen the tissues against illness was by the use of wholemeal rather than "devitalized" white bread.

Dr. Tredgold said that the many eminent mental specialists who were councillors of the League were concerned with the urgent necessity for provision for the treatment of early cases of mental disorder: also provision for the treatment of children suffering from the sequelæ of encephalitis lethargica. The hospital problem was referred to by Mr. C. J. Bond, who urged that the department contribute on insurance lines to a hospital service which should be co-ordinated in regard to methods.

Other points dealt with were the evil effects of overcrowding, and tuberculosis in children.

Mr. Chamberlain, in his reply, said that the ministry had already issued a pamphlet on diet, and this was available for the public: others would probably follow, although he doubted how far a government department should go in the issue of pamphlets which would be of a popular nature and yet would be open to criticism by specialists. He proposed to accept generally the recommendation of the Food Preservatives Committee, which would be circulated in order that the interests affected could make out their case against them. As regards smoke abatement, he doubted whether it would be politic to introduce a bill regarding this just at present, as there were so many government measures of an urgent nature waiting to be passed through. He had learnt that the Board of Education was about to make special provision for dealing with children showing mental and moral deterioration after encephalitis lethargica. With regard to hospital services, he assured the deputation that he was at one with them in their desire to secure better co-operation, but he felt that there must first be a reform of the Poor Law, and the government had undertaken to deal with this matter.

H. E. MacDERMOT

AUSTRALIA

The Commonwealth Government has recently passed an act for the establishment of a museum of Australian zoology. This has been done largely at the instigation of Dr. Colin Mackenzie who has fostered for several years the study of Australian fauna in its natural state, and who has now handed over to the government as a gift his laboratory equipment, together with his collection of live animals and museum specimens. It is the most important existing collection dealing with the fauna of Australia, and under the act referred to will form the nucleus of a national Australian museum analogous to the Hunterian Museum in London and the Smithsonian in Washington. The value of this plan is exceedingly great from a zoological point of view, for the museum is one of Australian zoology; it is not simply an Australian museum of zoology. The Australian fauna provide special and peculiar features in the study of comparative anatomy, but apparently it has been found that many of the Australian mammals are rapidly becoming extinct, and the establishment of the museum as a government institution is a well-conceived and liberally executed design for preserving these, as well as may be, in the interests of science generally. Dr. Mackenzie has been appointed first director of the Museum, which is now established in Melbourne, but will eventually be transferred to the new Commonwealth capital at Canberra. High appreciation has been expressed by the Minister of Home and Territories of the fine public spirit which prompted Dr. Mackenzie to make the initial gift, and its unhesitating acceptance by the government, with the attendant responsibilities, has been

justly compared with Pitt's far-seeing act in securing for the British nation the Hunterian Museum, which formed the nucleus for the great collection of the Royal College of Surgeons of England.

The establishment of this museum is a recognition that comparative anatomy is not merely an academic matter, but is one of fundamental importance to medical science and to biology generally. H. E. MACDERMOT

News Items

GENERAL

REPORT FROM THE AMERICAN SOCIETY FOR THE CONTROL OF CANCER

Dr. Howard Canning Taylor, of No. 20 West 53rd Street, Professor of Clinical Gynecology at the College of Physicians and Surgeons, and President of the American Gynecological Society, was elected President of the American Society for the Control of Cancer at the annual meeting of the Society held in its rooms, No. 370 Seventh Avenue, March 7, 1925. Dr. Taylor, who has been the Society's vice-president and chairman of its executive committee, succeeds Dr. Charles A. Powers, deceased. Thomas M. Debevoise was re-elected secretary, and Calvert Brewer was again elected treasurer. Dr. Francis Carter Wood was elected vice-president.

In the annual report of Dr. George A. Soper, Managing Director, evidence was presented to show that the efforts of the Society to acquaint the public with the early symptoms of cancer in order that those who were affected may receive speedy treatment had borne fruit throughout the country.

The latest report of the Pennsylvania Cancer Commission showed that in Pennsylvania from 1910 to 1923, the average time between the first symptoms and operation in superficial cancer cases had dropped from 18 months to 14.6 months, and that the average time between which a patient consulted a physician and was operated on dropped from 13 months to 4.5 months. Where deep cancers were concerned, the results were even more striking. Twelve years of educational work had cut down the average time between the discovery of the first symptoms of superficial cancer and the first call on the doctor 20 per cent, and reduced the interval between the patient's first appearance at the doctor's and the beginning of medical treatment 65 per cent in superficial cancer and 70 per cent in deep-seated cancer.

The Society's efforts for the year had included systematic work among the public, members of the medical profession, nurses, dentists and students at medical colleges. The Society's publications had all been revised to contain the latest information. Exhibits had been made at many notable meetings of professional men and women.

With reference to clinics, the cornerstone of a permanent institution had been laid in connection with the medical school of the University of Minnesota, the funds having been provided by Mrs. George Chase Christian, a member of one of the Society's committees. A temporary clinic had been successfully operated at Fall River, Massachusetts, under the direction of Dr. E. P. Truesdale of that city, aided by Dr. Francis Carter Wood.

The director's report showed that inquiries for information have greatly increased during the twelve months. They included letters from physicians of England, Spain, Cuba and Italy who wished information to guide them in the conduct of campaigns for the control of cancer in their countries.

Dr. Soper recommended that during the coming year work be continued along present lines and broadened in some directions; that "cancer weeks" be generally held; that further efforts be made to enlist the co-operation of dentists, nurses and social workers; that the work undertaken in Connecticut be extended to other states, and that the Pennsylvania survey be duplicated elsewhere in the country.

We have before us copies of the last issues of the Vancouver and Nova Scotia Medical Association Bulletins. These two little publications give evidence of the active part being played by these associations in medical affairs and fully justify their appearance. Dr. Parfitt of the Gravenhurst Sanatorium contributes a stimulating paper in the Nova Scotia *Bulletin*, on the "Pitfalls in Treatment of Tuberculosis," in which he reviews the most modern methods in the management of this disease. In the *Vancouver Medical Bulletin* we note "The Osler Lecture" on "Aphasia" by Dr. Fred Brodie, together with valuable notes on benzol poisoning and vital statistics from the Vancouver Health Department.

The Association of Officers of the Army Medical Service of Canada is holding its first annual meeting since re-organization in Ottawa on Tuesday and Wednesday, April 14th and 15th. A good programme of papers dealing with medical matters of interest to all army medical officers is being arranged, and it is hoped that there will be a good attendance.

All medical officers of the Canadian service whether active or on the Reserve are eligible for membership.

NOVA SCOTIA

Dr. J. Osler MacLean, Dalhousie 1922, has passed the Pennsylvania State Board examinations and has been admitted to practice in that State.

Dr. Clyde W. Holland, Dalhousie 1923, returned recently from England, where he was pursuring post-graduate studies, and is to leave shortly for New York to take a position on the staff of the Sloane Hospital.

Dr. Hubert A. Lyons, Dalhousie 1923, who has had appointments at the Montreal General and Royal Victoria Hospitals, is now filling an appointment with the Society of the Lying-in Hospital, New York.

Dr. Clyde S. Marshall, a 1924 graduate of Dalhousie, has been awarded a fellowship in neurology and psychiatry by the Rockefeller Foundation, and will leave shortly to take up special studies in these subjects.

The Department of the Public Health, Nova Scotia, announces the opening of a second treatment

clinic, for the treatment of venereal diseases, in Halifax. This clinic is situated at the Dalhousie Health Centre.

On February 25th, the Halifax branch of the Medical Society of Nova Scotia held a clinical session at the Victoria General Hospital. Cases presented included one of cerebral syphilis and one of paralysis agitans, demonstrated by Dr. Silver; one in which frequent, profuse hæmoptyses were found to be dependent on mitral stenosis, shown by Dr. K. A. MacKenzie; and one of unusually extensive acne vulgaris shown by Dr. Mack. Dr. Johnston demonstrated a number of x-ray plates illustrative of redundancy of the colon, and Dr. Nicholls demonstrated specimens, one of mixed sarcoma and carcinoma and one of round celled sarcoma of the testicle. Doctors G. W. Grant, K. A. MacKenzie, Nicholls, Burris Murphy, Carney, Little and H. G. Grant took part in the discussions. On the 11th of March, the subject for discussion was blood chemistry. Dr. V. N. MacKay opened with a general consideration of the subject but with particular reference to acidosis. Dr. K. A. MacKenzie followed, dealing with the blood chemistry of diabetes, while Dr. Churchill took up the blood chemistry of renal conditions. A lively debate followed, which was participated in by Doctors Birt, Gibbs, Young, H. K. MacDonald, Maclellan and those who initiated the discussion.

The January and February meetings of the Osler Medical History Club were held at the residences of Doctors John Cameron and Gerald Grant, respectively. In each instance the host of the evening contributed the paper. Dr. Cameron described his examination of the mummies of two Egyptian princes of the twelfth dynasty, Khnumu Nekht and Nekht Ankh, illustrating his discourse with numerous lantern slides which showed such differences in the bones of the brothers as to lead him to suspect that one was an eunuch. Dr. Grant's paper reviewed most interestingly the life and work of Boerhaave, who retired from the rectorship of the University of Leyden just two hundred years ago. He referred to the continuance of the celebration of Boerhaave's birthday by the citizens of Leyden as a striking evidence of the impress made by his work. Dr. Cameron exhibited a copy of the Osteographia of William Cheselden, published in 1733, and Dr. Nicholls showed a copy of Aetii Medici, published in 1549. The latter, which is to be presented by the club to the Dalhousie Medical Library, was published by Froben, and bears the caduceus on the title page. Froben was the first medical publisher to adopt the caduceus as a title page device.

Vigorous opposition is being waged to a by-law recently adopted by the City Health Board of Halifax, to become effective June 20th, prohibiting the sale of any milk in the city which is not certified or pasteurized. The City Council has asked the provincial government to disallow the by-law. At the public hearings there has been a large attendance, showing an interest which is seldom shown in public health matters. The sentiment appears to be strongly against the enforcement of the by-law. Medical opinion is divided, perhaps not so much on the matter of pasteurization as on the ground that proper enforcement of the by-law will prove as difficult as that of other prohibitory laws.

The annual report of the Inspector of Humane and Penal Institutions of Nova Scotia was presented to the Legislature some days ago. The report shows that during the past year, the various general hospitals in the province which come under the inspection admitted 14,599 patients. The Grace Maternity Hospital, Halifax, admitted 511 patients; the Nova Scotia Hospital (for the insane), 247; the Nova Scotia Sanatorium, 258. In the general hospitals, there were 8,617 operations performed, and in them there were 656 births. The births in the Grace Maternity Hospital numbered 460. The expenditures of the several hospitals, not including the three government institutions (Victoria General Hospital, Nova Scotia Hospital and Nova Scotia Sanatorium) amounted to $44,147.24. The various local asylums and alms-houses admitted 830 persons. To all the institutions coming within the Inspector's jurisdiction there were admitted 16,187 persons, an increase of 2,112 over the preceding year. The Inspector states that all the general hospitals of the province having a capacity of fifty or more patients are on the approved list of the American College of Surgeons.

W. H. HATTIE

QUEBEC

At the annual meeting of the Royal Victoria Hospital, Montreal, held recently, Sir Vincent Meredith, Bart. was re-elected President of the Board of Governors. Two new appointments were made, Dr. Duncan MacCallum as assistant physician, and Dr. W. T. S. Mitchell as associate psychiatrist. It was announced that the excavation work for the new maternity wing of the hospital had been completed, and construction work was now commencing. During the year the admittances to the hospital had numbered 9,070. These included nineteen free patients and 3,000 private patients. Of these 352 patients had died, making the death rate for the year 3.8 per cent.

At a meeting of the Montreal City Council attention was called to the insufficiency of the city hospital accommodation, and a motion was proposed that the city and provincial government should either contribute to the erection of a city hospital or should advance funds to permit an extension of the Montreal General Hospital so as to enable it to meet the present and future needs of the population. The great increase in the size of the city during the past few years had taken place without any appreciable increase in the hospital accommodation. The motion was carried unanimously without calling for a vote.

A very interesting address was given on the evening of March 12th at the Mount Royal Hotel under the auspices of the Metropolitan Life Insurance Company by Dr. W. H. Parke, director of the Health Department of New York City. The gathering was a large one, and included all those who were interested in the treatment of contagious disease. The subject of his theme was the treatment of diphtheria and scarlet fever. The necessity in cases of diphtheria of using the antitoxin early and in one full dose was emphasized by him. The new sera for scarlet fever recently discovered by Dr. Dick and Dr. Dochez were described and their value emphasized. The chair was occupied by Dr. Wilfred Derome, who spoke of the prominent part taken by Dr. Parke in the development of preventive medicine. These remarks were seconded in English by Dr. Hanford McKee, President of the Medico-Chirurgical Society.

Dr. Paul Villard, associate professor of French in McGill University has been nominated for the rank

of Chevalier of the Legion of Honour by the French Government. The decoration has been bestowed in recognition of services rendered in France by Dr. Villard during the war and since then in his capacity as chief medical officer to the French Government in Canada. He was made officer d'Academie 1909, officier de l'instruction publique in 1914, and in 1921 the French Government gave him the first class gold medal for distinguished services.

Dr. T. J. W. Burgess, F.R.S.C., who retired two years ago from the position as medical superintendent of the Protestant Hospital for the Insane, at Verdun, celebrated his seventy-sixth birthday recently. Dr. Burgess was educated at Upper Canada College, Toronto. He graduated in 1870, winning both the gold and silver medals. He was for sixteen years connected with various insane asylums in Ontario, and afterwards came to Montreal to assume the control of the Verdun Asylum which gradually expanded under his direction till it now contains 800 patients, and is recognized as one of the more important hospitals for mental disease in North America.

McGill University has been notified of a gift of $50,000 from the Laura Spelman Rockefeller Memorial for the provision of a laboratory fitted specially for the study of disease in children to be connected with the McGill Faculty of Medicine. The money will be paid at the rate of $10,000 a year for five years.

An additional gift of $1,500 is added to provide for the initial equipment of the laboratory. The Laura Spelman Rockefeller Memorial has, we understand, a capital of $87,000,000, the interest of which is devoted to advance the study of sociology.

ONTARIO

PRELIMINARY PROGRAMME OF THE FORTY-FIFTH ANNUAL MEETING OF THE ONTARIO MEDICAL ASSOCIATION TO BE HELD AT TORONTO, MAY 5, 6, 7, 8, 1925.

General Notes Regarding the Meeting

Time.—Daylight Saving.

Headquarters.—Tuesday—Academy of Medicine, 13 Queen's Park. Wednesday, Thursday, Friday—Crystal Ball Room, King Edward Hotel.

Accommodation.—Rates—Room and bath, single, $4.00, $6.00; double, $6.50, $9.00. Please arrange direct with hotel and do it early.

Motors.—Special parking privileges in the vicinity of the hotel are being granted by the city police department. Write the Secretary for a green cross sticker.

Mail, Telephone, and Telegrams.—Should be addressed c/o Ontario Medical Association, King Edward Hotel, Toronto.

Programme.—There are to be no sectional meetings. All papers will be presented in general session, making the entire programme available to the members. Subjects of great general interest have been chosen for presentation. The plan is a radical departure from former meetings and one which the Directors hope will meet with general approval.

A Special Social Hygiene Clinic will be held at the Toronto General Hospital on the morning and afternoon of Tuesday May 5th, 1925. The Secretary will be pleased to receive notification from Practitioners who would like to attend.

Tuesday, May 5th

Academy of Medicine, 13 Queen's Park

10.00 a.m.—Meeting of the Board of Directors.

11.00 a.m.—Meeting of the Committee on General Purposes.

2.00 p.m.—Meeting of the Committee on General Purposes.

6.00 p.m.—Meeting of the Nominating Committee.

7.30 p.m.—Round Table Dinner, King Edward Hotel. (Informal). Price, $2.00. Open to all members who make reservation with the Secretary. Guest—Mr. Basil Hall, President of the British Medical Association. A very pleasant evening is anticipated.

Wednesday, May 6th

Crystal Ball Room, King Edward Hotel

9.00 a.m.—Registration.

10.30 a.m.—Report of the Committee on General Purposes.

11.00 a.m.—"Asthma," E. H. Chant, Toronto. "Differential Diagnosis of Abdominal Tumours," Wallace Scott, Toronto. "Obesity and the Endocrines," H. C. Wales, Toronto. "Abdominal Diseases Requiring Emergency Operation," G. Silverthorn, Toronto.

12.30 p.m.—Luncheon, Private Dining Room—One Dollar.

XUM

2.00 p.m.—"Artificial Pneumo-thorax, W. B. Kendall and C. D. Parfitt, Gravenhurst. "Thoracoplasty in Pulmonary Tuberculosis," N. S. Shenstone, Toronto. "Corneal Injuries and their complications," Percy MacFarlane, Hamilton. "Diagnosis and Management of Swellings Associated with Bone," T. A. J. Duff, Toronto. "Kidney Function Determination in Private Practice," G. H. Agnew, Toronto. "Diathermy," Harold D. Storms, Hamilton.

4.30 p.m.—Adjournment to Reception Hospital. Short address by C. B. Farrar, to be followed by a tour of inspection of the hospital.

7.30 p.m.—Association Dinner—ladies invited —cover charge, $3.50. This is the big get-together function of the annual meeting. In addition to the Presidential Address by Dr. George S. Young, an excellent programme is being provided.

THURSDAY, MAY 7TH

Crystal Ball Room, King Edward Hotel

9.00 a.m.—"Symposium on Uterine Hæmorrhage, F. W. Marlow, H. M. Tovell, F. A. Cleland, Toronto. 'Present Status of Tryparsamide Treatment in Cerebro-Spinal Syphilis," C. M. Crawford, Whitby. "Swellings in Groin and Scrotum," E. D. Busby, London. "Failing vision after mid-life, accompanied with local painful symptoms," Duncan MacLennan, Toronto. "Acute Empyema," L. J. Austin, Kingston. "Practical Points on Treatment of Toxæmias of Pregnancy," H. B. VanWyck, Toronto.

12.15 p.m.—Association Business.

12.30 p.m.—Luncheon, Private Dining Room, One Dollar.

2.00 p.m.—"What the General Practitioner should know about Anæsthetics, for use in his own practice," Samuel Johnston, Toronto. "The Evaluation of Surgical Risks from the General Practitioner's Viewpoint, F. H. McMechan, Avon Lake, Ohio. "Significance of failing vision after mid-life, not associated with local pain," J. C. Connell, Kingston. "Erythema Nodoum," W. T. Connell, Kingston. "Maternal Nursing," George Smith, Toronto. "Infections of the Hand," George E. Wilson, Toronto. "Some Common Disorders of the Heart," J. M. McCulloch, Peterborough. "Urinary Obstruction," Gordon Foulds, Toronto.

8.00 p.m.—"The Goitre Prob'em," Francis Lahey, Boston. "Problems in Medical Practice in England," Basil Hall, President British Medical Association. "The Complex Motor Phenomena of the Human Stomach," (moving picture, L. C. Cole, New York.

FRIDAY, MAY 8TH

9.00 a.m.—"One Thousand Obstetrical Cases in General Practice," H. L. Emmett, Fonthill. "Residual Deformities from Fractures," W. E. Gallie, Toronto. "The present status of hepatic efficiency tests," E. M. Watson, London. "An Easily Established regimen which controls and cures chronic gastric ulcer and chronic duodenal ulcer," D. H. Arnott, London. "Swellings of the Neck, exclusive of Goitre," R. I. Harris, Toronto. "Deficiency Diseases of Children," F. F. Tisdall, Toronto. "Hæmaturia," J. C. McClelland, Toronto. "Difficult Feeding Problems," Lionel Lindsay, Montreal.

12.15 p.m.—Association Business.

12.30 p.m.—Luncheon, Private Dining Room, One Dollar.

2.00 p.m.—"Acute Inflammation of the Ear, Nose and Throat, Crawford C. McCullough, Fort William. "Hoarseness," Gordon New, Rochester, Minn. "Scarlet Fever," Gordon Cameron, Toronto. Demonstration of Dick Test, arranged by George S. Strathy and J. G. Fitzgerald, Toronto. "Biliary Disease as seen in General Practice," F. N. G. Starr, Toronto. "Sinusitis in Relation to Diseases of the Bronchi," E. A. Broughton, Toronto. "Gastric and Duodenal Ulcer," F. B. Mowbray, Hamilton.

7.30 p.m.—Alumni and Class Reunion Dinners. Excellent accommodation in the Ball Room for everybody. Classes are urged to get together and arrange tables. Watch for special announcements.

CANADIAN SOCIETY OF ANÆSTHETISTS FIFTH ANNUAL MEETING

IN CONJUNCTION WITH ONTARIO MEDICAL ASSOCIATION

KING EDWARD HOTEL, TORONTO, MAY 6, 7, 8, 1925

Preliminary Programme

Presidential Address.—"Anæsthesia in Retrospect." J. J. Buettner, Syracuse, N.Y.

"The Evaluation of Surgical Risks from the standpoint of the General Practitioner." F. H. McMechan, Avon Lake, Ohio.

"What the General Practitioner should know about Anæsthetics for use in his own Practice." Samuel Johnston, Toronto.

"The Pre-Operative Preparation of the supposedly fit Patient." Professor Groat, Syracuse, N.Y.

"The Practical Application of the Theory of Anæsthesia." V. E. Henderson, Toronto.

"Anæsthesia in Thyroid Surgery. Lincoln F. Sise, Boston, Mass.

"Blood Pressure Guides and Safeguards in Anæsthesia with Special Reference to the Energy Index." J. H. Evans, Buffalo, N.Y.

"Anæsthesia in Children." C. H. Robson, Toronto.

"The use of Ethylene in Tonsillectomy." Don Warren, Hamilton.

"Records and what they show." T. R. Hanley, Toronto.

"Lung Complications in 1,000 Consecutive Operations at the Royal Victoria Hospital, Montreal." J. W. Armstrong, Montreal.

"Some Observations on the Management of the poor Surgical Risk." H. J. Shields, Toronto.

Demonstrations are being arranged in the Department of Pharmacology by Professor Henderson and Dr. W. E. Brown and also clinics at the various hospitals.

The March meeting of the York County Medical Association was held on Thursday, March 5th at the Toronto Western Hospital. Dr. Joseph A. Gilchrist who has charge of the diabetic work at the Christie Street Military Hospital gave a lecture on the general scope of a diabetic diet and the use of insulin. Dr. Ferguson who has charge of the diabetic laboratory at the hospital, gave a laboratory demonstration of the tests employed in urinary and blood chemistry in diabetics. Dr. Fred Hipwell of the Western Hospital Diabetic Clinic, gave a diabetic clinic in the hospital wards and presented a dozen patients in various stages of treatment. S. W. O.

The second annual Inter-Relations dinner of the medical profession and the public was held at the King Edward Hotel on the above date. At eight o'clock about one hundred members of the Association sat down to dinner with guests selected for the occasion.

Following the dinner, short addresses on the work of the Inter-Relations Committee and the activities present and proposed of the Ontario Medical Association, were delivered by the Chairman, Dr. H. W. Hill; the President, Dr. Geo. S. Young, and the Secretary, Dr. T. C. Routley.

The Honourable G. Howard Ferguson, Prime Minister of the province, who was the main speaker of the evening, delighted his audience with many references to the broad subject of education, as viewed by him, not only as Premier, but as Minister of Education of the province. Mr. Ferguson stressed the fact that education should be made available for all. In referring to higher education, the Premier pointed out that it costs the State approximately $500.00 per year per individual for university education. He announced that it was his intention to decentralize, as far as possible, higher education. His proposed plan suggests that some of the collegiate institutes in the province undertake to carry their students along over the subjects now occupying very largely the first two years of the university training. This was the first public announcement of this proposed policy. Mr. Ferguson complimented the Association on the good which it was doing and expressed his pleasure at being present at a gathering where the profession and so many branches and workers of the public were represented.

Following the Premier's address, the chairman threw the meeting open to a general discussion.

At a meeting of the Muskoka District Medical Society, held at the Library of the Muskoka Hospital for Consumptives on February 4th, the following addresses were given:—"Gall bladder conditions," Dr. E. S. Ryerson; "Differential diagnosis in abdominal conditions," Dr. Roscoe Graham. On March 4th, Dr. F. W. Marlow addressed the Muskoka Medical Society on "Pelvic conditions."

On February 4th, Dr. John Oille addressed the Lincoln County Medical Society at St. Catharines, his subject being "Rheumatic fever and endocarditis."

Dr. W. E. Gallie, of Toronto addressed a meeting of the Kingston and Frontenac Medical Society on February 9th, his subject being, "Living sutures."

The South Waterloo Medical Society met at Galt on February 12th, Dr. John MacGregor, of London, gave an address on "Blood diseases."

At a meeting of the Brant County Medical Society held at Brantford on February 12th, Dr. John Oille gave a talk on "Coronary Thrombosis."

The Peterborough Medical Society met on February 12th, Dr. T. Alex. Davies, of Toronto, gave a talk on "The ear and the general practitioner."

At a meeting of the Sault Ste. Marie Medical Society on February 13th, Dr. W. H. Dickson, of Toronto, gave an address on "The diagnosis of conditions of gastro-intestinal tract and of gall bladder by the use of x-ray."

Dr. H. D. Storms, of Hamilton, addressed the St. Thomas Medical Society on February 13th, on "Physiotherapy as an aid to medicine."

On February 17th, Dr. G. E. Richards, of the Department of Radiology, Toronto General Hospital, addressed the Welland County Medical Society on "The field of radiation therapy, including ultra-violet light, x-rays and radium."

At a meeting of the North Waterloo Medical Society held at Kitchener on February 20th, Dr. J. G. Fitzgerald spoke on "The place of antitoxins, serums and vaccines in the control of communicable diseases."

The Hamilton Medical Society met at the General

XUM

Hospital, Hamilton, on February 25th; Dr. W. R. Campbell, of Toronto, spoke on "The diagnosis and treatment of goitre."

The Thunder Bay Medical Society met at Port Arthur on February 28th. Dr. J. M. McCullough, of Peterborough gave an address on "Common disorders of the heart."

Dr. A. J. Grant, of Western University Medical School, London, addressed the Essex County Medical Society at Windsor on March 3rd, his subject being, "Neoplasms of the female breast; differential diagnosis and treatment."

At a meeting of the Hamilton Medical Society on March 4th, Dr. Robin Pearse, of Toronto, gave a talk on "Haematuria."

The Niagara Falls Medical Society met in Niagara Falls on March 11th. Dr. D. M. Low, of Toronto, gave an address on "Modern views on the toxæmias of pregnancy."

At a meeting of the Lincoln County Medical Society held at St. Catharines on March 6th, Dr. J. K. McGregor, of Hamilton, gave a talk on "Treatment, surgical and non-surgical, of Goitre."

On March 6th, Dr. W. O. Stevenson, of Hamilton, gave an address before the St. Thomas Medical Society on "Indications and limitations of surgery in chronic abdominal disease."

MANITOBA

Changes in legislation with respect to treatment of drug addicts are to be embodied in a bill, to be introduced in the House shortly, probably by Hon. D. L. McLeod, municipal commissioner. The provisions of the bill are in line with requests made by a number of organizations interested, and it is hoped to have the bill passed in all the provinces.

Under the proposed bill, specified officers of the health department may on hearing of a drug addict, instruct him to take treatment. Following such instruction if the patient does not take treatment or does not improve after having taken treatment, he may be committed to whatever institution may exist, where aid may be given.

The main idea underlying the bill is to get away from the method of treating such cases through the criminal courts as a number of them are treated now.

The act, which the government proposes to enact, is already in force in the Province of Alberta.

The Winnipeg Shriners' hospital for crippled children which is located in the east wing of the first floor of the Children's Hospital on Aberdeen Ave., was opened for the reception of patients on March 16. Twenty beds have been provided for the reception of children under fourteen years of age requiring orthopædic care and whose parents are unable to pay for treatment. The unit is under the direction of Doctor Angus A. Murray as surgeon-in-chief, with Miss K. McLearn as superintendent. The management of the unit is vested in a local board of governors assisted by one member of the international board of trustees. The local governors are A. W. Chapman, chairman; W. A. McKay, vice-chairman; A. Thomson, Secretary; Dr. W. F. Taylor, D.D.S., W. H. Carter, H. I. Hazelton, Jas. Mackie, C. C Fields, and Albert Olson, potentate of Wa Wa Temple at Regina. A ladies' auxiliary has been chosen. An outdoor clinic will be provided each Tuesday morning. The Shriners of Winnipeg have spent about $7,000.00 in fitting up their portion of the Children's Hospital to meet the requirements and to conform to the design and arrangement which characterize all the Shriners' hospitals in America. The institution will treat children from the Great Lakes to the Pacific Coast.

The annual meeting of the shareholders of the Medical Arts Building, Winnipeg, was held on the evening of March 18th. The financial report showed the institution to be in an excellent financial position. The building, four storeys in height, and of fire proof construction, is located at the corner of Graham and Kennedy Streets. It was opened in the spring of 1923 and from the first every available foot of space has been occupied by some eighty doctors and dentists. Two stores on the ground floor have as tenants a druggist and a branch of a powerful x-ray corporation. The shareholders comprise only doctors and dentists who are actually tenants in the building and the success of the enterprise to the present day is a fine example of what may be accomplished by a strong and well directed community spirit.

Professor J. B. Collip, of the Department of Biochemistry, University of Alberta, addressed a special meeting of the Winnipeg Medical Society on March 16. His subject was "Parathyrin and Tetany" and the address was illustrated with lantern slides.

Dr. J. R. Davidson showed a case of subparathyroidism with tetany who has been greatly benefited by the use of parathyrin.

Prof. Collip read this paper at the International Congress of Medicine at Washington.

SASKATCHEWAN

The Regina and District Medical Society held their regular monthly meting February 27th. A motion was brought up by a Regina specialist to the following effect: "That the doctors confining themselves to special work be allowed to run indefinitely a professional card in the public press." This motion was not received with favour by the members but the Society decided to leave it over for discussion at a future meeting.

As the next annual meeting of the Canadian Medical Association is to held in this city, the Regina executive are a very busy organization at the present in an endeavour to make the meeting a great success.

The rest of the business was therefore confined to merely routine matters.

ALBERTA

Dr. William Hackney, President of the Alberta Medical Association, has called a meeting of the executive of this body, to arrange for the annual meeting to be held in Calgary this summer. The success of last year's gathering was augmented by the assistance given by the Canadian Medical Association's representatives. As the annual meeting of this Association will be held in Regina this year, it is anticipated that several clinicians will be available for the Alberta Association's Convention.

The chiropractors of Alberta are petitioning the government of the province to amend their Act, so as to permit their licensing body, which is composed of two representatives from the Faculty of Medicine, of Alberta University, two chiropractors, and the Deputy Minister of Health, to grant interim licenses to applicants coming to the province, who are desirous of practising, pending the holding of the next examinations.

Dr. J. D. MacLean, of Etzikom, has moved to Jasper.

Dr. W. A. Lincoln, F.R.C.S. (Eng.), of Calgary left recently to attend the meeting of the British Association of Surgeons, which will be held in Dublin, towards the end of April. He will also visit London and Paris Hospitals before returning home, about the end of June.

Dr. T. H. Blow and Dr. G. D. Stanley, have returned from Vancouver.

Dr. Jessie Allyn, who formerly practised in Edmonton, but who has been latterly a medical missionary in India, has arrived in Alberta on a year's furlough.

Dr. W. S. Quint, of Calgary, until recently pathologist and Radiologist with the group clinic of the Associate Physicians has opened a laboratory in the Grain Exchange Building, Calgary.

Dr. A. E. Aull and Dr. E. A. Talbot, were heavy losers in the fire which recently destroyed the building in which their offices were.

Professor J. B. Collip, of Alberta University, addressed the members of the Calgary Medical Society, March 3rd, on the subject of "some recent advances in Physiology."

BRITISH COLUMBIA

The Vancouver Medical Association has to record, with deep regret, the death of one of its members in the person of Dr. J. E. Brouse. Dr. Brouse practised for many years in New Denver and latterly was on the staff of the Vancouver General Hospital as dermatologist. His son, Dr. Iven Brouse, is in practice at Powell River.

On February 25th, Dr. C. E. Hagyard, of Seattle, spent the day in Vancouver. In the morning he conducted a clinic at the Vancouver General Hospital, and in the evening addressed the members of the Vancouver Medical Association, his subject being "Chronic Non-Specific Colitis." Dr. Hagyard is noted as an authority on gastroenterology south of the line.

On February 3rd, Dr. W. A. Dobson read a paper before the Vancouver Medical Association on "Neuroses in Everyday Practice." This was a most interesting and practical paper and was much enjoyed by the members.

Dr. A. I. Brown left Vancouver recently for a trip to the Orient and expects to be absent from his office for about two months.

Dr. F. N. Robertson and Dr. W. C. Walsh have gone east for post-graduate work and will be back in about six weeks.

The programme for the 1925 Summer School of the Vancouver Medical Association is nearing completion. Among the speakers who have promised to come to Vancouver this year are Dr. Hugh Cabot, Sir Henry Gray and Dr. Alan Brown. The meetings are on July 2nd, 3rd and 4th.

The Fraser Valley Medical Society, one of the most active and progressive in the province, held its monthly meeting on February 4th. It was attended by all the New Westminster doctors and also by Dr. L. Broe, of Hammond, and Dr. F. D. Sinclair, of Cloverdale.

Interesting addresses were given by Dr. D. A. Clarke on the "'Dick' Test and Scarlet Fever," and Drs. Bruce W. Cannon and G. W. Sinclair (New Westminster) on "Anatomy, Physiology and Surgery of the Pancreas."

At the last meeting of the Fraser Valley Medical Association, held on March 5th, Dr. W. A. Robertson, of New Westminster, gave an excellent talk on "Fractures about Joints," and Dr. H. B. McEwen on "Insulin."

The City Council, at a meeting on February 16th, decided to proceed with the erection of a new infectious diseases hospital to be located on Willow Street on land now occupied by the temporary huts which house the cases of infectious diseases. The new building is to cost in the neighbourhood of $200,000 and will be conducted as part of the Vancouver General Hospital.

Dr. S. E. Beech has relinquished his practice at Ashcroft, and is now at Salmon Arm, B. C.

Dr. Richard Gibson who has been in practice in Vancouver for some years, recently went to Ashcroft to take over the work of Dr. S. E. Beech at that place. Dr. Gibson has the best wishes of his many friends in Vancouver.

It is interesting to note that several vacancies in the province have recently been filled through the business office of the British Columbia Medical Association.

A meeting of the Victoria Medical Society to be held on Monday, March 9th, will be addressed by Mr. Johnston, Deputy Minister of Finance in the Provincial Legislature, on "Health Insurance." It is understood that Mr. Johnston has made a deep study of this important subject and his views should prove interesting to the profession.

Dr. R. C. Weldon has relinquished his practice at Natal, B. C. and is at present at Dartmouth, Nova Scotia. On his return to British Columbia, after post-graduate work, Dr. Weldon will probably specialize.

XUM

United States

The staff of the New York Polyclinic Medical School and Hospital, the pioneer post-graduate medical organization in America, on March 7th, at the Hotel Astor, gave a brilliant testimonial dinner to Dr. K. Winfield Ney, Dean and Professor of Neuro-Surgery. The dinner was given to Dr. Ney in appreciation of his services in the reorganization of the institution, and was attended by the trustees and 125 members of the teaching staff.

During the war, post-graduate teaching at the Polyclinic was abandoned, its staff being greatly depleted by many of its members assuming military service. The government took over the institution for the treatment of wounded soldiers, and because of lack of hospitalization facilities was unable to relinquish the institution until 1922, at which time it was returned to Dr. John A. Wyeth, its original founder. At this time Dr. Wyeth was advanced in years and died before effecting a satisfactory reorganization. In the summer of 1924, Dr. Ney was placed in charge of the Polyclinic and in a comparatively short time has succeeded in establishing a highly effectual post-graduate teaching organization. The institution is now running full capacity and plans are being made to more than double its facilities. After two rather discouraging years of reorganization, it has come into its own and is doing more effectual work in post-graduate teaching than at any time in its history.

Book Reviews

Pediatrics. By various authors. Edited by Isaac A. Abt, M.D. Vol. IV, 1271 pages, 218 illustrations. Price $11.00. W. B. Saunders Co., Philadelphia and London; Canadian Agents, the J. F. Hartz Co. Ltd., Toronto and Montreal. 1924.

The fourth volume of Abt's Pediatrics is an important addition to a system which has so far been the most comprehensive work of its kind published in English.

The writers are men of acknowledged ability and have successfully compiled the modern views of internal medicine and interpreted them in their special application to childhood. The chapters on the heart, kidney and blood are especially good. The bibliography is extensive and readily accessible during the perusal of each article.

This system furnishes a decided aid to the reader in pediatrics, be he specialist or general practitioner.

H. S. SPOHR

Pediatrics. By various authors. Edited by Isaac A. Abt, M.D. Volume V., Face and Jaws, Orthopedic Surgery, Tuberculosis, Hereditary Syphilis, Infectious Diseases, Infection and Immunity. Philadelphia and London, W. B. Saunders & Co., 1924. Canadian Agents, The J. F. Hartz Co. Ltd., Toronto, and Montreal.

The first five hundred pages of this volume are concerned with a presentation of the modern treatment of various surgical conditions in children; following this portion are chapters on diseases of the bones, including osteomyelitis, osteogenesis imperfecta, and chondrodystrophia. The discussion of the surgery of tendons by Leo Mayer is very lengthy and complete. The whole surgical section of the work is profusely illustrated with excellent diagrams and photographs, particularly that section dealing with tuberculosis of the bones. The surgical measures advised in treatment are those in common use. A new and unusual chapter is that by Archer O'Reilly on Bone and Joint Syphilis. He states that a Wassermann test should be made as a routine in all cases of bone and joint disease. Several chapters are devoted to the various dislocations and ankyloses, with methods of treatment. The chapters on congenital malformations of the hand and fingers, and on rachitic deformities of the legs, by Arthur Steindler, are profusely illustrated and discuss at length the various methods of treatment. The section on cerebral spastic paralysis states that in the newborn the haemorrhages (causing these deformities) are almost always just above or below the dura, and the clots can easily and safely be evacuated by operation; if the vessel is still bleeding it can be tied!! The section on congenital syphilis by Veeder and Jeans is excellent, particularly as regards symptomatology. The descriptions of the various specific infections is fittingly concluded by a general discussion of infection and immunity, including blood grouping, the complement fixation reactions and anaphylaxis. R. R. STRUTHERS

Reports from the Laboratory of the Royal College of Physicians of Edinburgh. Edited by Sir Oliver Robert William Philip, M.D., LL.D., and Anderson Gray M'Kendrick, M.B. Vol. XV, illustrated. Oliver and Boyd, Edinburgh. 1924.

The papers of which this volume is composed have all been published previously, each one in the journal which would bring the special research done to the notice of the largest number of those most interested.

Collecting the papers into one book, is, however, a good thing, in that it gives the general reader an opportunity of reading articles that otherwise he might not see, either because he does not have available the various technical journals or fights shy of them. It is quite certain that there are more general practitioners interested in reports of research, and who would read them if made as easily available as these papers, than is thought.

As this work was all done and published in 1922-23 a special review at this time is difficult, but one cannot help noting the wide variety of work undertaken and the care taken in its presentation, both as to the subject matter itself and the conclusions drawn.

The pathological section is well worth the time anyone might give to reading it. The work of Fraser on deaf-mutism being of the type one would expect from him, and no one interested in bone work should miss Dawson and Struther's report on generalized osteitis fibrosa.

This book deserves a place in institutional and medical libraries, generally. C. S. MCKEE

The Elements of Colloidal Chemistry. By Herbert Freundlich, Ph.D. Translated by George Barger, F.R.S. 210 pages with diagrams. Price 7s. 6d. Methuen & Co. Ltd., London, 1924.

Dr. Barger has performed a most useful task in the translation of this excellent though short treatise on the elements of colloidal chemistry by Professor Freundlich. The book is a non-mathematical introduction to the subject of colloidal chemistry. It deals quite fully, however, with fundamental details and should commend itself to medical students as a text for supplementary reading in connection with courses in physiology and biochemistry, in which subjects colloidal chemistry is coming to be a very integral part.

J. B. COLLIP

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Anæsthesia for Nurses. By William Webster. 153 pages, illustrated. Price $2.00. The C. V. Mosby Co., 508 North Grand Boulevard, St. Louis. 1924.

Col. Webster's small handbook of Anæsthesia for Nurses presents, in a clear and readable form, all that is necessary for a nurse anæsthetist to know.

The physiology of anæsthesia is presented in a simple and interesting way. All the principal anæsthetics, including ethylene, and their mixtures are explained. There are specially useful chapters on the difficulties and complications of anæsthesia, on preliminary medication, and on surgical shock.

Apparently, Col. Webster does not accept Levy's explanation of the cause of syncope under chloroform. His views of the value of direct injections into the heart immediately after it has stopped, during anæsthesia, are not in accord with the experience of many who have had to deal with this emergency.

We note that in writing of artificial respiration the patient is described as being "generally in the prone position, lying on the back." W. B. HOWELL

A Synopsis of Special Subjects. Diseases of the Skin, by H. Semon, M.D. **Obstetrics and Diseases of Women,** by M. Donaldson, F.R.C.S. **Ear, Nose and Throat,** by Archer Ryland, F.R.C.S. **The Eye,** by J. F. Cunningham, F.R.C.S. 376 pages. Price 18s. net. H. K. Lewis & Co., Ltd., London, 1924

This is a handy book of reference for practitioners and in the preface nothing more is claimed for it; indeed the authors state that "it cannot be commended from the literary or educational point of view." In the various sections the subjects are treated of in a synoptic way. Thus under the diseases of the skin various divisions deal with "Eruptions of Known Etiology," "Doubtful Etiology," and "Unknown Etiology." Each disease is briefly described and the treatment given shortly. There is a separate index for each section of the volume.

In the section on obstetrics the subject is divided into "Pregnancy," "Labour," and "Puerperium." There is a good chapter on "Pregnancy complicated by Constitutional Diseases" but in considering heart disease we think that dangers incident to pregnancy accompanied by mitral stenosis should have been emphasized. The diseases of women are taken up seriatim in connection with the various organs and there is an additional sub-section on "Disorders of Function." In the other sections the diseases are also considered in connection with the parts involved. We note a straightforward and lucid discussion of the signs and symptoms of the various forms of motor paralysis of the larynx.

Under diseases of the external auditory meatus such a comparatively rare condition as otomycosis (*aspergillus niger* or *albus*) is mentioned, but under diseases of the tonsils we fail to find any reference to the lingual tonsil. On page 302 paracusis is misspelt *paracasis*.

This volume cannot fail to be useful to the general practitioner, for constantly he comes across puzzling conditions which are off his beaten track, so to speak. We hope, as is suggested in the preface, the number of special subjects dealt with may be increased in future editions. As we expect of a book printed by Robert Maclehose & Co. Ltd., the University Press, Glasgow, the type used and spacing employed are excellent .

ARCHIBALD MALLOCH

Operative Surgery. Covering the Operative Technic involved in the operations of general and special surgery. By Warren Stone Bickham, M.D., F.A.C.S., Former Surgeon in charge of General Surgery, Manhattan State Hospital, New York. In six octavo volumes. Volume VI completing the set contains 989 pages, 1224 illustrations. Price Cloth $10.00 per volume. Sold by subscription only. Index volume free. Philadelphia and London: W. B. Saunders Company, 1924.

This volume completing as it does the monumental work of the industrious author consists of sixteen chapters covering the surgery of the seminal vesicles and prostate gland, all of those conditions generally included under the head of gynæcology, certain operations on the new-born, and certain operations for deformities and disabilities not included in preceding chapters.

With regard to prostatic surgery, it would appear that the author favours the perineal route advocated so enthusiastically by Hugh Young, rather than the supra-pubic method generally adopted in this country; and moreover it would also appear that references to Freyer's work are rather discounted in favour of that of Albarran. While there may be good reasons for this it nevertheless remains true that more than 90 per cent of the prostatic operations done in America follow the Freyer technique—possibly as modified by Squier of New York.

The chapters on gynæcological operations are complete, and describe the different methods generally adopted, but as has been remarked in reviews of previous volumes, rather tend to describe too fully somewhat obsolete methods such as Hegar's Vaginoperineorrhaphy, or the Alexander-Adams method of Ventro-Suspension.

However, these criticisms in no way detract from the undoubted fact that the author has succeeded in producing probably the most complete, comprehensive and clearly illustrated work on operative surgery of the present day in the English language.

Possibly the outstanding feature of the entire series is the unqualified excellence and abundance of the illustrations, second only to which is the care in having the text follow these closely so that there is very seldom any difficulty in following the operations as described.

Perhaps a word of approbation should be added regarding the desk index, which so far as one can judge is a real index and should enable the searcher after information to put his finger on the proper page and volume with the least waste of energy.

In conclusion, the author is to be congratulated on the fruition of his labours, which reflect great credit on his industry and surgical common sense. To these the work should live as a monument for many years to come.

E. R. SECORD

An African Holiday. By Richard L. Sutton, M.D., LL.D. 180 pages, 102 illustrations. Price $2.25. The C.V. Mosby Co., 508 N. Grand Boulevard, St. Louis, 1924.

If, as Dr. Sutton remarks, "all good sportsmen go to Africa," a good many of us will have to be left out of that category. It is for those so unprivileged, however, that books such as his are written, and very pleasantly, on the whole, does this one serve in its capacity as a substitute. We are taken somewhat breezily through the trials and tribulations of a Nimrod transporting 4,000 rounds of ammunition and six high-powered rifles from New York to the east coast of Africa through France, a country into which the importation of arms and ammunition is strictly forbidden. And then, before coming to his actual sporting experiences Dr. Sutton gives some interesting notes on the country and various tribes. He pays a graceful tribute to British government in the sentence "that Mombasa being under British rule it is needless to say that the town and country are well governed," and he comments on the efficient methods by which the natives are registered, both by the use of finger prints, and also by a system of employers' returns which keeps the government informed of the movements of all natives.

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journey up to Nairobi is apparently very great, and the doctor records a praiseworthy resolution not to kill a single one of the graceful Thomson's gazelles, the animal usually first to be seen. The zebra (Burchell's) he characterizes as the most useless animal on earth, but of its ornamental qualities he gives full photographic proof, and he also describes using them as bait in his lion shooting.

There is an interesting medical sidelight by which he explains a lisp in one of his bearers, a man of splendid physique and temperament: but he belonged to a tribe which many years before had suffered from an epidemic of tetanus, and since then every tribesman has invariably had two of his permanent front teeth extracted.

Perhaps the climax of the book is reached in the descriptions of big game hunting. Dr. Sutton never fails in his photographs to give us most admirable representations of the various trophies of his prowess, as well as of native life and scenery. Altogether it may be said that he succeeds in imparting to the reader a considerable share of the attraction and novelty which we seek in books of travel. H. E. MacDERMOT

Pathogenic Microorganisms. By William Hallock Park, M.D. and others. Eighth edition, enlarged and thoroughly revised, with 211 engravings and 9 full-page plates. Price $6.50. Published by Lea and Febiger, 706 Sansom Street, Philadelphia. 1924.

The new edition (eighth) of Park and Williams *Pathogenic Microorganisms* is a very serviceable book. It continues to be the same clear and concise bacteriological manual. A large amount of new material has been added, bringing it up to date with the recent advances in bacteriology. This is especially noteworthy in regard to the completeness of the information given concerning the recent developments in our knowledge of immunity in diphtheria. Appropriate recognition is also accorded the more recent work in connection with the etiology of scarlet fever. In grouping microorganisms attention has been paid to the classification adopted by the Society of American Bacteriologists and new nomenclature is used to some extent. A splendid text for medical students and vade mecum for laboratory workers. J. J. OWER

Thacker's Indian Medical Directory for 1924. Printed and published by Thacker's Directories, Limited, Calcutta and London. Sixth year of publication.

This volume is a medical directory containing lists of the Royal Army Medical Corps, Indian Medical Service, Indian Medical Department, private practitioners, hospitals, chemists and druggists, nursing homes, Queen Alexandra's Military Nursing Service for India, medical missions, dentists and dental surgeons. The editors in their introduction express thanks for the help generously given by the senior members of the medical profession in India which has made the information far more complete than it has been before. The book is well printed and will, we feel sure, prove of value to all who are in want of the information which it is intended to supply.

An X-ray Atlas of the Normal and Abnormal Structures of the Body. By Archibald McKendrick, F.R.C.S., D.P.H., F.R.S.E., and Charles R. Whittaker, F.R.C.S., F.R.S.E. 220 pages, 388 radiograms and 25 diagrams. Price 25*s.* net. E. & S. Livingstone, 16 Teviot Place, Edinburgh, 1925.

The authors of this book do not overlook the fact that correct interpretation of radiograms can only be satisfactorily learned from studying actual negatives, and by following screen examinations, but those not having such facilities may be helped considerably by having some normal plates for reference; and it is for just such a purpose that this atlas is designed.

From the viewpoint of the teacher of anatomy also this atlas is a welcome addition to the number of aids which he invokes in the teaching of that protean subject. There has been very complete coordination of the more technical aspect of x-ray work and of its anatomical and surgical bearing.

The arrangement of the plates is excellent, the first sixty being devoted to the normal joints, and it is shown how different appearances are brought out by alteration of the focus point. The explanations are clear and concise, and full descriptions are given of the various stages of ossification. We note the excellent notes and diagrams on the radiography of the carpus.

To look through this Atlas is to pass in review a large number of surgical conditions, some of great rarity. The plates are almost without exception admirably clear, and the volume will form a valuable addition to the library of both the teacher and the practitioner.

H. E. MacDERMOT

Diseases of the Heart. Henri Vaquez, M.D., translated by George F. Laidlaw, M.D., with an introduction by William S. Thayer, M.D., F.R.C.P.I. (Hon.). Octavo volume of 743 pages, illustrated. Price $9.50. W. B. Saunders Co., Philadelphia and London; Canadian Agents, The J. F. Hartz Co. Ltd., Toronto and Montreal, 1924.

After reading this volume through carefully one cannot but help feel that the subject of "Diseases of the Heart" has been presented with a thoroughness that leaves little to be desired from the standpoint of the student, as well as the initiated.

The author, perhaps the leading French authority on cardiology, was a follower of "le père Potain." He writes concisely, states his reasons clearly, and is usually definite in his conclusions, without being dogmatic. His descriptive style throughout makes it a very readable book and apparently very little has been lost in the translation.

The great care with which the radioscopic examination of the heart has been worked out impresses one with its value and suggests its more frequent utilization in this country after the methods of Professor Vaquez.

The translation is by Dr. George E. Laidlaw, of New York, with an introduction by Dr. William Thayer, of Baltimore. The English edition is a credit to the editors and one makes no mistake in recommending it as a text-book for students or as a reference book for the initiated.

C. E. B.

The Practice of Pædiatrics. By Charles G. Kerley, M.D. Third Edition, revised and reset. Octavo of 922 pages, 150 illustrations. Price $9.00. W. B. Saunders Co., Philadelphia and London; Canadian Agents, The J. F. Hartz Co. Ltd., Toronto and Montreal, 1924.

The newest edition of Kerley's book *The Practice of Paediatrics* is in the main written along the same lines as the previous editions. Some new material has been added, the most significant being that on developmental gastrointestinal anomalies as shown by x-ray studies. Many excellent x-ray plates are included. These are unusually clear and on the whole highly instructive. The book is fairly exhaustive, very concise, never ponderous; sometimes, however, to the exclusion of moderately important discussions on the pathology or biochemistry of certain conditions. The section on infant feeding contains some excellent feeding directions which should prove useful in perplexing cases. Throughout the book, everything is dealt with in the most practical kind of way. While comparatively little pathology is included there is a great deal on treatment, and prescriptions abound. This book should have its place on the bookshelf of the pædiatrist and the practitioner. Kerley has not failed to impart to his book the same practicalness and resourcefulness which he himself possesses.

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Gynæcology, Medical and Surgical. P. Brooke Bland, M.D. Students' edition. 1257 pages, 644 illustrations. Price $11.00. F. A. Davis Co., 1914 Cherry St., Philadelphia. 1924.

This work by the assistant professor of gynæcology in Jefferson Medical College is dedicated to his former chief, Dr. E. E. Montgomery. The plan adopted by the latter in his well known text-book of classifying the various conditions found in the pelvic organs has been followed by the author. Thus, such conditions as inflammation, hæmorrhage, and new growth are considered in sequence from the vulva to the pelvic cellular tissue. While this arrangement in some cases leads to repetition it is logical and comprehensive.

In the section on diagnosis newer methods of examination such as pneumo-peritonæum, trans-uterine insufflation of the tubes, and the estimation of the basal metabolic rate are described.

Regarding treatment the author wisely inclines to conservatism. Considerable space is devoted to the application of radium and deep x-ray therapy in gynæcological conditions, especially malignancy.

The section on tumours is complete and satisfactory. Sampson's recent work on endometrial transplants is mentioned.

The illustrations are numerous and good and the make-up of the book is excellent. The text is longer than is necessary and the work could be revised and cut down with advantage. A good feature of the book is the list of authors mentioned in the text. R. B. M.

Diagnosis and Treatment of the Infectious Diseases. By F. H. Thomson, M.B., C.M., D.P.H. 208 pages, illustrated. Price 7s. 6d. net. H. K. Lewis & Co. Ltd., 28 Gower Place, London, W.C. 1. 1924.

This small volume, as explained in the preface, is a series of clinical talks on the diagnosis and treatment of the infectious diseases, based on the author's prolonged experience in the London hospitals. That section of the book devoted to the discussion of clinical diagnosis is most interesting and many minor points are emphasized which are frequently overlooked, the discussion on the diagnosis of smallpox and of scarlet fever being particularly detailed and valuable.

On the other hand the treatment suggested for the various diseases makes curious reading to one accustomed to the methods prevalent on this side of the Atlantic; e.g., surely the use of peptonized milk, plasmon, sanatogen and Benger's food in almost all diseases belongs to a previous generation and does not deserve a place in a modern scientific treatise. The omissions as regards modern treatment are equally interesting; blood transfusion is not mentioned at all even for collapse from typhoid hæmorrhage, and the intravenous use of serum is not considered. "Practically all are agreed that tracheotomy is superior to intubation" is not true in America, and the suction method of treating laryngeal diphtheria is apparently unknown to the author. There are no illustrations except a few borrowed from Ricketts' and Byles' work on smallpox. The little book cannot be regarded as a text-book of the infectious diseases, and one wishes the author had confined himself to his interesting discussions on the clinical manifestations of these diseases and their differentiation. H. B. CUSHING

Medical and Sanitary Inspection of Schools. By S. W. Newmeyer, A.B., M.D., Assistant Chief Medical Inspector, Bureau of Health; Supervisor of School Medical Inspection, Philadelphia. Cloth, 462 pages, 79 engravings and 6 full page plates. Price $4.00 net. Lea and Febiger, Philadelphia, 1924.

This commendable little volume emanates from the pen of a man who has devoted twenty-four years to the study and practice of every phase of the work connected with the medical and sanitary inspection of schools and is modern in every respect; it covers in detailed fashion all the problems confronting the medical inspector. The subject matter is presented in seven parts each handling different portions of the subject. Part 1 is devoted to administration and is concerned largely with the qualifications and duties of the personnel including the medical inspector and school nurse. Numerous valuable charts are shown illustrating the systems of record keeping. In Part 2, about eighty pages are devoted to construction of schools and furnishes many valuable ideas on the latest approved thought relating to sanitation and safety. The balance of the book deals in turn with (a) The public health aspect of communicable diseases; (b) Physical defects, particularly in regard to the eyes, ears, nose, throat, teeth and orthopædic conditions; (c) Health of teachers; (d) Mentality; and finally, (e) Allied subjects of school health emphasing rural school medical supervision.

The author has not only depended upon his own wealth of information but has liberally drawn from experts in many walks of life with the result that he has succeeded in collecting most up-to-date data regarding school inspection. The volume is well printed, the text is excellently constructed and the book as a whole will serve admirably the need of the physician, medical officer of health, public health nurse and anyone else interested in this important field of preventive medicine.

F. W. LUNEY

Planning a Small Community Hospital. Publication No. 34, from the Department of Health, Ottawa.

This booklet contains a fund of very valuable information, and the Department of Health should be congratulated on this, its latest publication. So often the contemplation of establishing a small community hospital is discouraged by the inability of those interested, to view the subject in its proper perspective. This booklet which is in its way a small text-book on the question of planning the organization and requirements of a small hospital should tend to guide boards of management along the proper lines, when contemplating the establishment of a small community hospital. It is doubly valuable in so far as up until the present there were very few text-books on this subject, and it will be welcomed by all in the hospital world facing these problems.

A. K. HAYWOOD

The Practical Medicine Series Vol. I. General Medicine. Edited by George H. Weaver, M.D. and others. 736 pages, illustrated. Price $3.00. The Year Book Publishers, 304 S. Dearborn St., Chicago. Series 1924.

The volume as a whole is well written. While the authors have in most cases given a summary at the end of the subjects, in a number of cases they have omitted to give this summary and in other cases the summary is indefinite. The volume would be more valuable as a reference had the summary been given in every case, and been more thorough.

Part I deals with infectious diseases and endocrinology in an especially interesting manner. While the authors appear to be somewhat severely critical of some of the endocrine preparations on the market at the present time, they have great faith in thyroid extract and insulin. They believe there is a great field for the development of endocrinology.

Great strides have been made during the last few years in the treatment of infectious diseases, especially diphtheria and scarlet fever. The authors look for similar progress in the treatment of other infectious diseases very shortly.

Part II deals in a very careful manner with the progress in the diagnosis and treatment of diseases of the chest and lungs, and makes special mention of the advance in the diagnosis and treatment of pulmonary tuberculosis.

Part III gives a thorough review of the progress in diagnosis and treatment of diseases of the heart, blood,

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and blood making organs. While much of this part is more adapted to the interne and specialist, there are nevertheless many pages from which the general practitioner can derive benefit.

Part IV discusses very minutely the advances made in connection with diseases of the gastro-intestinal tract, diseases of the gall bladder and of the liver and metabolism.

This volume will prove serviceable to the busy medical practitioner by affording him an excellent resumé of the year's progress in the departments mentioned

J. E. LOVERIN

Books Received

General Systematic Bacteriology—By R. E. Buchanan, Ph.D. Volume I. 597 pages. Price $6.00. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, 1925.

Serum Diagnosis of Syphilis by Precipitation—By R. L. Kahn, Sc.D., 237 pages. Price $3.00 net. Williams & Wilkins Co., Mt. Royal and Guilford Aves., Baltimore, 1925.

The Surgical Clinics of North America—Volume IV, Number 5 (Portland-Seattle Number, October, 1924). 263 pages with 112 illustrations. Per clinic year (February, 1924 to December, 1924). Paper $12.00; Cloth $16.00. Philadelphia and London, W. B. Saunders Co. The J. F. Hartz Co. Ltd., Toronto and Montreal.

The Diagnosis of Children's Diseases with special attention to the diseases of infancy—By Professor E. Feer. Translated by Carl Ahrendt Scherer, M.D., F.A.C.P. 550 pages, illustrated. Price $8.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1925.

An X-Ray Atlas of the Normal and Abnormal Structures of the Body—By Archibald M'Kendrick, F.R.C.S., D.P.H., F.R.S.E., and Charles R. Whittaker, F.R.C.S., F.R.S.E. 220 pages, 388 radiograms and 25 diagrams. Price 25s. net. E. & S. Livingstone, 16 Teviot Place, Edinburgh, 1925.

Operative Surgery—By J. Shelton Horsley, M.D., F.A.C.S. Second edition. 780 pages, 666 illustrations. Price $12.00. The C. V. Mosby Co., 508 N. Grand Boulevard, St. Louis, 1924.

An Introduction to Practical Bacteriology as applied to Medicine and Public Health—By T. J. Mackie, M.D., D.P.H., and J. E. McCartney, M.D., D.Sc. 300 pages. Price 8s. net. E. & S. Livingstone, 16 Teviot Place, Edinburgh, 1925.

Operative Surgery—By Warren Stone Bickham, M.D., Phar. M. (Tulane), M.D. Columbia), F.A.C.S. Vol. VI. 989 pages, 1,224 illustrations. Price $10.00. W. B. Saunders Co., Philadelphia and London; Canadian Agents, The J. F. Hartz Co., Toronto and Montreal, 1924.

Bacteria in Relation to Man. A Study-Text in General Microbiology—By Jean Broadhurst, Ph.D. Octavo, 304 pages, 147 illustrations. Price $3.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1925.

The Crippled Hand and Arm—By Carl Beck, M.D. 243 pages, 302 illustrations. Price $7.50. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1925.

Practical Lecture Series 1923-24—Delivered under the auspices of the Medical Society of the County of Kings, Brooklyn, New York. 484 pages, 132 illustrations and three coloured plates. Price $5.50. Paul B. Hoeber, Inc., 67 E. 59th St., New York, 1925.

General Index to Bickham's Operative Surgery—Vols. I to VI. 190 pages. W. B. Saunders Co., Philadelphia and London; Canadian Agents, The J. F. Hartz Co., Toronto and Montreal, 1924.

An African Holiday—By Richard L. Sutton, M.D., LL.D., 180 pages, 102 illustrations. Price $2.25 The C. V. Mosby Co., 508 N. Grand Boulevard, St. Louis, 1924.

Infection, Immunity and Inflammation—By Fraser B. Gurd, B.A., M.D., C.M., F.A.C.S. 330 pages. Price $5.00. The C. V. Mosby Co., 508 N. Grand Boulevard, St. Louis, 1924.

A Text Book of Physiology for Medical Students and Physicians—By William H. Howell, Ph.d., M.D. Ninth edition, thoroughly revised. Octavo of 1069 pages, 308 illustrations. Price cloth $6.50. Philadelphia and London, W. B. Saunders Co. Canadian Agents: The J. F. Hartz Co. Ltd., Toronto, 1924.

Medical Education. A Comparative Study—By Abraham Flexner. 334 pages. Price $2.50. The Macmillan Co. Ltd., New York and Montreal, 1925.

Fractures and Dislocations—By Philip D. Wilson, A.B., M.D., F.A.C.S., and William A. Cochrane, M.B., Ch.B., F.R.C.S., Edin. 800 pages, 978 illustrations. Price $11.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1925.

A Text-Book of Practical Therapeutics with especial reference to the application of remedial measures to disease and their employment upon a rational basis—By Hobart Amory Hare, B.Sc., M.D., LL.D. Nineteenth edition. 1061 pages, 144 engravings and plates. Price $7.00. Lea & Febiger, S. Washington Sq., Philadelphia, 1925.

Genito-Urinary Diseases and Syphilis, including their surgery and treatment—By Charles S. Hirsch, M.D., fourth edition, revised. 337 pages, 44 illustrations. Price $2.00 net. P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, 1925.

A Text-Book of Chemistry and Chemical Urinalysis for Nurses—By Harold L. Amoss, M.D. Third edition thoroughly revised . 248 pages. Price $2.25. Lea & Febiger, S. Washington Sp., Philadelphia, 1925.

Proceedings of the International Conference on Health Problems in Tropical America held at Kingston, Jamaica, B.W.I. 1010 pages, illustrated. The United Fruit Co., Boston, 1924.

Medicine. An Historical Outline—By M. G. Seelig, M.D. 207 pages, 49 illustrations. Price $2.25. Williams & Wilkins Co., Baltimore, 1925.

Dynamic Psychology—By Dom Thomas Verner Moore, Ph.D., M.D. 444 pages illustrated. Price $3.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1924.

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Heredity in Nervous and Mental Disease. An Investigation by the Association for Research in Nervous and Mental Disease . 332 pages, 48 illustrations. Price $3.75 net. Paul B. Hoeber, Inc., 67 E. 59th St., New York, 1925.

Tumours of the Spinal Cord—By Charles A. Elsberg, M.D. 420 pages, 354 illustrations. Price $10.00 net. Paul B. Hoeber, Inc., 67 E. 59th St., New York, 1925.

Diseases of the Rectum and Pelvic Colon—By Martin L. Bobkin, M.D., F.A.C.S. Second edition revised and enlarged. 487 pages illustrated. Price $6.00 net. E. B. Treat & Co., 45 E. 17th St., New York, 1925.

The Technic of Local Anæsthesia—By Arthur E. Hertzler, A.M., M.D., Ph.D., LL.D., F.A.C.S. Third Edition. 272 pages, 140 illustrations. Price $5.50 net. The C. V. Mosby Co., 508 N. Grand Blvd., St. Louis, 1925.

The Practical Medicine Series, vol. iv.—Pædiatrics. Edited by Isaac A. Abt, M.D., with a collaboration of Johanna Heumann, M.D. 381 pages illustrated. Price $2.00. Year Book Publishers, 304 N. Dearborn St., Chicago. Series 1924.

An Introduction to School Medicine—By H. Leslie Cronk, M.A., M.D., D.P.H., Cant. 236 Pages, 8 illustrations. Crown 8vo. Price 7s. 6d. net. H. K. Lewis & Co. Ltd., 28 Gower Place, London, W.C.1, 1925.

Congenital Esophageal Stenosis Above Cardiac Orifice. — The pathologic picture at operation and the configuration of the roentgenograms were so alike in the three cases reported by Alfred A. Strauss and J. H. Hess, Chicago, that they might be taken for one case. Fluoroscopic examination revealed a narrowing of the esophagus just above the diaphragm, and from there upward a marked saccular dilatation. When the sac was filled with barium, marked peristaltic waves and retroperistalsis were seen. As to other anomalies associated with this condition: In one case there was slight hypertrophy of the pylorus as in congenital pyloric stenosis; a non-rotated cecum, located to the left of the gallbladder under the liver, and a well formed Meckel's diverticulum. In another case, there was such lack of rotation of the cecum that the cecum and colon formed a straight tube from underneath the liver, left of the midline, to the rectum. The fact that the patients came for treatment usually between two and three years of age, in itself shows the chronicity of the condition and indicates only a partial obstruction. The symptoms become pronounced at the age when the infant is given solid food; he has vomiting spells, which vary in intensity and frequency with the amount of esophageal dilatation, spasticity, and retroperistalsis. Not infrequently the child does not vomit for several weeks when given only finely divided food, such as cereals, milk and custards, but there are periods when he cannot swallow any semi-solid food and retains little liquid. These patients may acquire such tolerance to food remaining in the dilated part of the esophagus that, two hours after eating, they vomit large quantities of food, which is alkaline in reaction and has never passed into the stomach: or on attempting to eat in the morning, they may vomit large quantities of mucus that has accumulated in the large dilated sac of the esophagus during the night. In the latter case, repeated attacks of bronchitis occur, owing to aspiration of large amounts of saliva and retained food. In all three cases, marked connective tissue bands were observed to run from the diaphragm around the esophagus where it entered the stomach. After dividing these bands the little finger was passed through the hiatus of the diaphragm and the esophagus loosened from the surrounding structures for about 4 or 5 cm. By downward traction on the esophagus and stomach, and by pushing the diaphragm upward with two narrow ribbon-shaped retractors, 5 cm. of the esophagus with its constricted portion was pulled through the diaphragm. The anterior wall of the stomach was opened near the entrance of the esophagus, and a fine No. 8 French catheter passed through the opening of the stomach and the esophageal stricture out through the mouth. A very small dilating instrument was then attached to the catheter and traction applied until the instrument was pulled up into the most constricted portion of the esophagus. Three longitudinal incisions, about 2 cm. in length, one on each side and one anteriorly, were made through the muscularis down to the mucosa of the constricted portion, and the muscularis was slightly separated from the mucosa. The anterior wall of the stomach was closed with three layers of sutures.—*Jour. Am. Med. Ass.*, Feb. 14, 1925.

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